AMERICAN JOURNAL OF PUBLIC HEALTH
and
THE NATION'S HEALTH

VOLUME 34, 1944

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AMERICAN PUBLIC HEALTH ASSOCIATION

1790 BROADWAY

NEW YORK 19, N. Y.

American Journal of Public Health
and THE NATION'S HEALTH

Volume 34 January, 1944 Number 1

Public Health Implications of Tropical and Imported Diseases*

Strategy against the Global Spread of Disease

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THIS is a public health war. In every theater, the fighting forces of the United Nations and the enemy alike are exposed to diseases of public health importance. In most of our combat areas, epidemic diseases are rife in the native population. Malaria encircles the globe, and is the foremost problem of military medicine in the majority of war theaters. Cholera prevails in India, China, and the Southwest Pacific; dysentery throughout the Tropics. In North Africa, the Near East, and Eastern Europe are the world's great reservoirs of louse-borne typhus. After an absence of many years, Germany acknowledges its presence there. Yellow fever is epidemic in Africa; it exists in jungle form in South America; and the mosquito vector thrives in the United States, the Mediterranean area, India, Burma, the Southwest Pacific. Dengue, borne by the same mosquito, occurs in the same regions. Everywhere in overseas fighting, we are confronted with venereal infections frequently pandemic, and with a high tuberculosis rate.

It is inevitable, therefore, that our fighting men are exposed to extraordinary disease hazards and that many will succumb. In every war of recorded time, disease has caused more military casualties than have battle wounds. This war is no exception.

Battle casualties cease when the fighting stops. Disease casualties continue to take their toll. In the three years after World War I, more people died of starvation and disease than were killed in the four years of fighting. Disease problems no less than the strictly military problems are unprecedented and infinitely complex in this global war. Consider, for example, the mass displacement of population—an estimated 12–15 millions of people in Europe—political and military prisoners, slave labor, and refugees. After the war, nothing will thwart the urge to go home. The more hunger, lowered resistance,

* Presented at a Special Session of the American Public Health Association at the Seventy-second Annual Meeting in New York, N. Y., October 13, 1943.

and epidemics, the more uncontrollable the dispersion toward home. Foci of infection will thereby be scattered into the remotest villages throughout Europe. In this total war, health problems also are total in their nature, affecting total populations.

Our strategy against the spread of disease, therefore, must be global in its scope. It is being developed in three overlapping phases. The *first* is directed toward the protection of our troops and of vulnerable areas while the fighting is on. The *second* deals with the emergency restoration of health conditions in reoccupied zones, through relief of starvation and epidemic control—a prelude to rehabilitation. The *third* evolves into world-wide collaboration for improved health.

From the military point of view, our public health defenses at home, at outlying bases, and in combat zones must parallel military efficiency in the total job of defeating the enemy. The enemy faces the same disease threats to his striking power; therefore, superiority in health protection of our troops is as much a requirement for victory as superiority in forces and supplies. No other military force in the world approaches ours in the proportion or competence of its medical and health components. For this superiority we suffer gladly the privations necessary at home. Yet there is a limit beyond which excellence in military health service defeats its total purpose through deprivation on the production front. Medical and health services in many communities now are below the margin of safety, as you know.

The health of military personnel requires the strengthening of health measures in surrounding civilian areas. This is true abroad no less than at home. Since we are fighting in the tropics and subtropics on a vast scale, we must prevent insect vectors from being transferred to vulnerable areas abroad, where they may hamper military operations, or to home areas where they can gain a foothold and disrupt war production.

Pestilence always has accompanied and followed in the wake of war. Every increase in the amount or speed of intercourse between nations has increased the threat of exotic disease. Air transport has leveled further the barriers of time and space against many epidemic diseases which hitherto have been successfully excluded from vulnerable areas. Much of our foreign air transport now traverses fever- and mosquito-ridden areas. Many air fields are little more than runways hacked out of the jungle, with no opportunity for sanitation. The native laborers are reservoirs of strange infection and the insects are pestilent. Under the pressure of war schedules or actual combat, sickness or an insect vector often becomes a stowaway to the next landing place. Such may have influenced the recent outbreak of dengue in Hawaii, and the recent introduction of the *Anopheles gambiae* and the tsetse fly from Africa into the Western Hemisphere.

As our fighting forces have been dispersed over wider and wider areas, we have seen more clearly the need to organize our defenses in depth to protect the battle front and the home front.

Our first-line defense is the combined effort of the United Nations to protect in so far as is possible their military forces from the health hazards of global warfare. Our second defense is the active and coördinated quarantine barriers being set up by the Army, the Navy, and the Public Health Service. Our own civilian health services constitute our deep defense on the home front. The last is supported by biological and environmental factors here at home which give us the opportunity of confining to local outbreaks any infection which may slip through the lines.

Joint research to forge sharper

weapons has been expanded by the Army, Navy, and Public Health Service as an essential part of our strategy. Against malaria, for example, our weapons are not good. The search for more effective antimalarial drugs is urgent from the military point of view, because environmental control is impossible under combat conditions. Our knowledge of such exotic diseases as filariasis, schistosomiasis, and the leishmaniases is incomplete. These and many other problems of military significance are under constant study.

Last December, the President created the United States of America Typhus Commission, composed of officers of the Army, Navy, Public Health Service, and outside experts, and authorized it to study typhus fever and recommend measures for its control in any area affecting military personnel of the United States. The commission is now working in Africa and the Near East, in preparation for the huge typhus problem which is inevitable when our forces get into eastern or southeastern Europe.

Early in 1943, an Interdepartmental Quarantine Commission was set up to review and recommend changes in current laws and practices designed to prevent wartime spread of disease into this country or between military bases abroad. The commission is composed of medical officers of the Public Health Service, the Army, and the Navy, under the chairmanship of Assistant Surgeon General Dunnahoo. The commission has already completed a preliminary survey of the transmission of disease and disease vectors as a result of military operations, air transport, or surface travel. They are continuing their studies on several lines of communication east and west, and at foreign bases.

We shall have to reorient our quarantine strategy with regard to air transport, since long-range, land-based planes nowadays fly in from distant ports and land deep in the interior. We shall need to set up quarantine stations at inland airports where foreign traffic is heavy, as we already have done at the Washington Airport, now a world air center. As a further check on the rapid dispersion of infectious diseases through the interior, however, airports of entry should be located as near to the coast as possible.

International agreements limit national quarantine measures to the control of smallpox, typhus, plague, cholera, yellow fever, leprosy, anthrax, and psittacosis. Little can be gained from increasing the list, especially if thereby quarantine regulations should be used as a means of setting up trade barriers inimical to post-war economic reconstruction. The perennial problem of quarantine versus commerce is the same now as it was in 1881 when the Secretary of State, in opening the first international health conference held in the United States of America, referred to "... this conflict between permanent, free, and open intercourse of trade, ... with this particular and pressing emergency of the public health." Quarantine, therefore, has been a sieve. It should not become a barrier in war or peace to necessary intercourse between nations. Its basic philosophy expressed in current military terms is that of "the calculated risk."

International barriers should not be set up against all infectious diseases. To do so would put into the hands of unscrupulous health officials punitive weapons against normal commerce. To overcome this tendency, there is general adherence to international conventions which limit quarantine jurisdiction to the most dangerous diseases. In this country we have successfully escaped imported epidemics of non-quarantinable diseases such as measles, dysentery, scarlet fever, and typhoid fever through good internal health de-

fenses, including the operation of interstate quarantine.

Circumstances of war may necessitate strengthening the federal interstate quarantine function, since the diseases which most concern the experts as potential post-war threats are not and should not be subject to national quarantine regulations. The Army and Navy may be relied upon not to release infected personnel until they have received the maximum benefit from modern treatment. However, some of the tropical diseases to which our troops have been exposed are not amenable to perfect medical control, and unpredictable relapses will occur.

Malaria is the outstanding example. Inevitably, malaria cases will be dispersed through the United States by returning troops. Local outbreaks are probable in parts of the country like the Upper Mississippi or the Hudson Valley, which have malaria mosquitoes, but which have been free from infection for many years. However, it is believed that history will repeat itself and that such outbreaks will die out, because, as in the past, the environment is not favorable to perpetuating the infection. But we should accelerate nature's process with mobile control forces to deal with outbreaks in any area. The triumvirate of modern malaria control is the physician, the engineer, and the entomologist. Equipped to analyze a situation from these three approaches, trained to organize effective control, these teams will be available to deal with any emergency outbreak, whether of malaria or other insect-borne disease.

Since the beginning of mobilization, the Public Health Service has maintained a mosquito-free zone around military and war industrial establishments in all malarious areas, building upon the work done during the depression years. As a total result, the Army experienced last year the lowest malaria rate in its history among troops at home bases, although the bulk of them are in the South.

Yellow fever is a serious threat to all areas where the vector is present. The British, the Chinese, the Dutch are no less keenly aware than ourselves of the hazards to the Far East. Consider that one of our most important war air routes skirts areas in South America where yellow fever in the jungle form is endemic. It crosses tropical Africa, where yellow fever has been epidemic for years. And then the jump to India or on to China where teeming millions of people and the ubiquitous vector await only the virus to start a conflagration. One infected mosquito, one infectious case could light the fire of an epidemic far greater than those which flared in the United States during the last century.

Our troops are protected by improved vaccines, but it would be impossible to produce enough in time to protect whole civilian populations. There is not a port in the effective *Aedes* zone of the United States (below the southern boundary of Maryland) which is free of the yellow fever vector. We have begun control work at Miami, but we have a long way to go to equal the performance of Brazil where the yellow fever mosquito has been *eradicated* in every important port, and even in whole states.

As additional territory is conquered by our armed forces, urgent health problems will confront the occupying troops. Starvation and disease will be the two central facts. The control of epidemics will be a herculean task if the enemy wreaks the destruction in every city that he has done in Naples and on the Russian front.

For long months, intensive preparations have been made both by the military and by the Office of Foreign Relief and Rehabilitation to deal with anticipated problems. At the School for Military Government in Charlottes-

ville, for example, officers have been trained in problems of civil government, and the classes include a quota of Public Health Service officers, some of whom are now serving in Italy and North Africa.

Immediately after the OFRRO was created, Governor Lehman appointed a Health Advisory Committee composed of representatives from the government departments concerned and a few experts in international health problems. Coöperation was sought and gladly given by the Rockefeller Foundation and the Milbank Memorial Fund. All available epidemic and medical intelligence regarding each country has been pooled. Studies have been made of one country after another, embracing data on pre-war disease prevalence and distribution, sanitary and medical organization, number, size, and location of hospitals, health centers, laboratories, etc., the types of water supplies and methods of purification in each city, the estimated needs for medical and sanitary supplies, the number and location of camps for prisoners of war and political prisoners, the volume and nationality of slave labor, and estimates of the size and composition of the public health forces which will be needed.

When a country is reoccupied, there is an initial stage of military government. It may be assumed that as soon as the military situation permits, the government, while continuing under the general supervision of the theater commander, will be turned over to civilian auspices.

It has been announced that the United Nations and the nations associated with them in the war have been invited to sign an agreement in Washington on November 9, creating a United Nations Relief and Rehabilitation Administration. This will be the international agency through which public health control and other phases of relief and rehabilitation will be carried on. In the proposed agreement, the second objective is to aid in the prevention of pestilence and in the recovery of the health of the people.

In any liberated country the basic policy will be to reconstruct the national health service as soon as possible. Outside aid obviously will be needed, but such aid will attempt from the beginning to work with and through the official national health departments and their local branches.

There has been joint planning between this country and other United Nations in connection with the problems of each occupied and enemy nation. In particular, representatives of the Inter-Allied Committee on Relief in London and our group on this side have exchanged full information concerning general plans. We have agreed upon standard lists and packages of medical and health supplies, and upon a procurement program to insure their availability. We have similarly agreed upon the size and composition of the public health and medical teams which will be needed. One unpredictable element in our planning is the future course of military events in a particular area—the amount of destruction and the further displacement of populations which will occur before final victory. It is gratifying to report that there is joint staff work and joint operational plans in the war against disease just as there is on global military strategy and operations.

Attention should be drawn also to the progress which has been made during the war in Pan American coöperation for stronger hemispheric health defense. This is being done through the Pan American Sanitary Bureau and through the Coördinator of Inter-American Affairs in coöperation with the health departments of the respective countries.

Of great importance, too, in future

global strategy against disease is the United Nations Organization on Food and Agriculture which will be set up following the recommendations of the Hot Springs Conference. In this organization, the improvement of human nutrition is a first objective. This international office of nutrition will be closely related on the one hand to health, and on the other, to agriculture.

Let me attempt to focus all I have said up to now and bring the several parts into relation with each other. We are faced with unprecedented health problems in this global war. On many sectors we have United Nations teamwork in dealing with wartime health problems. Further teamwork is assured especially in nutrition and in relief and rehabilitation.

But we need to look ahead a step further. We should begin now to plan with our allies a permanent international health organization ultimately to become world-wide in scope. After the war the needs for such an organization will be greater than ever before. Air transportation will have broken down the barriers of time and distance. As a result of two world wars, we have learned that we cannot remain at peace with the rest of the world in flames. Similarly, I think, we cannot remain free from epidemic diseases if they rage in other lands. Moreover, improvement in health is the first step which needs to be assured in the backward nations if they are to attain a higher economic development.

International public health measures, therefore, should become the spearhead for peaceful international collaboration. Having learned to work and fight together to defeat the common enemy, we need equally to concert our efforts to the purposes of peace. The science of public health is the instrument through which much can be done to heal the wounds of war and to bring to mankind everywhere a new standard of healthful living which will surpass all previous human experience.

Public Health Implications of Tropical and Imported Diseases*

Yellow Fever and Typhus and the Possibility of Their Introduction into the United States

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THE American health officer in this time of war is facing increased responsibilities with a diminished expert staff. He might possibly be interested in a lurid description of the havoc inflicted by exotic virus and rickettsial diseases on armies and populations in previous wars and in foreign lands, but I feel certain that he would prefer that I proceed at once to discuss the anticipated risk of the introduction of such diseases into the United States and the practical precautions that should be taken.

As for the common virus diseases, most of them are already widespread within our boundaries, and therefore outside the subject of this symposium. Smallpox, for example, is present where the laws requiring vaccination are inadequate or not enforced, and it is inconceivable that a partly vaccinated population could be endangered by the return of fully vaccinated soldiers from foreign countries. The occasional introduction of smallpox by civilians from abroad or its transfer from one state to another may occur in peace as well as in war, and serves to reveal which communities are neglecting to keep themselves immune.

The pandemic of influenza during the first world war usually comes strongly to mind when war-engendered disease of virus origin is mentioned. There is no evidence to suggest that the appearance of this world-wide scourge had any relation to the war except coincidence. There is also no proof that the pandemic was due to a virus, as are influenzas A and B, although it would seem probable. It is hard to believe that any methods other than specific active immunization could protect adequately against the highly contagious influenzas. The most promising of the present vaccination methods still await field trial in the presence of an epidemic. We earnestly hope that we shall be spared the next visitation until the strain of this war on the people and their health departments is over and methods for producing active immunization against the known virus influenzas, and possibly applicable to pandemic influenza, have been made more effective and their results more lasting. In the meantime the state health departments can at least develop laboratory service in the field of virus diseases, as I have previously advocated before this organization,[1] and thereby become better prepared to assist in the

* Presented before a Special Session of the American Public Health Association at the Seventy-second Annual Meeting in New York, N. Y., October 13, 1943.

diagnosis of known virus diseases and to investigate the unknown.

YELLOW FEVER

Of the exotic virus diseases there is only one which needs special consideration—yellow fever. This tropical disease has been tricky and is still full of surprises. Time and again it has entered parts of the United States and has spread devastation until checked by cold weather. Its last visit was as recent as 1905 when it came to New Orleans, but nevertheless there is a tendency for health officers and the people generally to assume that the disease is a historic curiosity so far as this country is concerned, and will never return. Is it possible that the war situation will increase the risk of another introduction?

There seems to be no chance that smoldering infection will be fanned into flaming epidemics by the sending of our military personnel into the endemic areas of Africa and South America, or that members of the armed forces, returning while in the incubation period, will introduce the virus, inasmuch as all of those entering endemic areas are vaccinated against yellow fever. There are striking historical examples of extreme losses of men in military expeditions of non-immunes into the tropics, and yellow fever along with malaria and typhoid wrought havoc with our forces in Cuba during the Spanish-American war and the following period of military occupation. Fortunately a great mass of accurate and useful knowledge of yellow fever has been built up and published since then, beginning with the confirmation of Finlay's mosquito hypothesis by the United States Army Board in Cuba and leading up in steps to the discovery of the existence of jungle yellow fever, involving forest animals and new mosquito vectors,[2] and also to the devising and wide application of an effective method of vaccination.[3]

The discovery of jungle yellow fever put an increased emphasis on vaccination as a means of prevention, for the effective methods against the vector of the historic urban yellow fever, the domestic mosquito *Aedes aegypti,* could not be applied in the vast and almost uninhabited tropical forest. Accordingly vaccination is the sole reliance in fighting epidemic and endemic jungle yellow fever, and literally millions of persons have already been vaccinated. In some cases the purpose of vaccination is to protect travelers or military forces against expected exposure, and sometimes it is to stem the spread of an actual epidemic, but increasingly the intent is to immunize systematically as many inhabitants as possible in jungle yellow fever areas and especially around travel routes. This systematic vaccination prevents human infections which might occasionally introduce the disease into aegypti-infested towns and cause urban yellow fever capable of spreading through the channels of travel and trade. Barrier vaccination has also been practised. This consists in immunizing all the inhabitants in a zone between an area of jungle yellow fever and an uninfected region. The people around certain critical traffic points or seaports have likewise been vaccinated to lessen risks of spreading yellow fever. The urgent need for immunization of troops and civilians going to the endemic areas of Africa was emphasized in 1940 when the largest yellow fever epidemic ever recorded in that continent, with over 15,000 cases, occurred in natives of the Nuba Mountains, not very far from active theaters of war.[4]

If so much dependence is placed on vaccination, it is important to know the degree and duration of the immunity and the safety of the method. The vaccine now in use is essentially a strain of living yellow fever virus, derived from the original virulent Asibi strain from Africa and modified by prolonged

passage through tissue cultures. This strain, called 17D, has lost most of its viscerotropic and neurotropic virulence, while retaining a high degree of antigenicity. There are similarities between this vaccine and smallpox vaccine in efficiency and safety and probably in the duration of the immunity. While the degree of immunity, as measured by titration of antibody in the blood by means of mouse protection tests, tends to run down slowly with the passage of years, the recent Brazilian studies of Fox and Cabral,[5] based on especially sensitive protection tests, and the field observations of Bugher[6] in Colombia make it clear that most vaccinated persons remain immune for at least four years. This is not surprising considering the life-long immunity produced by the disease itself.

As for safety, the vaccine, made with a constant dried seed-virus tested by long experience and without the addition of any normal human serum, seems to be as innocuous as can be expected of any product containing living virus. Formerly, when a small quantity of human serum was being added in manufacture to help preserve the virus, a form of hepatitis resembling so-called catarrhal jaundice or common infective hepatitis appeared in many persons receiving certain lots of vaccine. In view of the reported appearance of the same phenomenon after injections of convalescent serum and transfusions[7] it was concluded that this hepatitis was in all probability due to the chance introduction of an icterogenic agent, probably a virus, encountered occasionally in human serum. Fortunately it was found possible to substitute added chick embryo juice for the serum, and at present serum is entirely excluded from the vaccine in all the laboratories manufacturing it. Millions of doses of serum-free vaccine have been issued during the past year without reports of jaundice attributable to the vaccine or other symptoms except the occasional malaise and slight rise of temperature frequently observed on the 6th or 7th day. This would seem to be the normal reaction.

The vaccine is not manufactured commercially anywhere, nor is it sent out to physicians. It is prepared in the United States in laboratories of the National Institute of Health in Montana and of the International Health Division of The Rockefeller Foundation in New York. Officers of the U. S. Public Health Service administer it without charge at a number of service stations to civilians who anticipate exposure in endemic areas. Distribution through ordinary channels is impracticable as there would be serious risk that the virus would die out and the vaccine become inert. The dried material must be kept cold and the redissolved vaccine must be injected immediately in accordance with the directions.

The most serious risk of introducing yellow fever is through air travel, and much is being done to control this situation. With travel time as a measure, the United States has been moved much nearer to the endemic areas in recent years and it would be quite possible for a person to be infected in the interior of Colombia, for example, and to reach the United States within the incubation period, or for an infected mosquito to make the trip. Geographically, yellow fever is not as near as it was early in this century, for recent surveys show that it is now absent from Mexico, Central America north of the Panama Canal, and the West Indies, although the infection is still present in the interior of Colombia and Venezuela and probably in Panama near Colombia, to mention only the nearest countries.[8, 9, 10]

The risk of bringing yellow fever in has been greatly reduced in several ways. Travelers visiting infected re-

gions have been encouraged to get themselves vaccinated and to carry certificates which relieve them of certain restrictions on non-immunes. Passengers arriving from endemic areas are inspected by quarantine officers and their temperatures are taken. Persons showing elevation of temperature or other evidence of illness are detained until a diagnosis is made. Those who are well and are non-immunes, but who have possibly been exposed within a few days are kept under surveillance by the health authorities at the places of destination for the remainder of the incubation period of 6 days, unless the destination is north of any region in which aegypti might breed. As for mosquitoes, all airplanes from suspected areas are disinsectized by spraying for the purpose of killing off all incoming insects, whether infected or not.

The remarks about our newest weapon against yellow fever do not imply that vaccination is a short cut in control which makes anti-mosquito work unnecessary. On the contrary, aegypti control remains the method of choice for cities and other places in the tropics and subtropics where this mosquito has become established. Aegypti is especially vulnerable, as it is highly domestic and accessible and not so widely distributed as is commonly supposed. This makes it possible for health departments to organize a systematic attack on the mosquito in its larval stages and so hasten this dangerous insect on the way to local extermination. The only limits are money, trained men, and the willingness of the public to allow complete periodic inspection of houses and premises. Most effective methods have been worked out in Brazil and applied with such success that in most cities and in many large areas *Aedes aegypti* can no longer be found. The methods used are being published in detail by Soper, Wilson, Servulo Lima, and Antunes,[11] and their report will be made available by The Rockefeller Foundation to health officers specially interested. It was the successes in aegypti extermination that gave Soper and Wilson the confidence to undertake the complete extermination of *Anopheles gambiae* in Brazil.[12]

The control of jungle yellow fever in foreign endemic areas through vaccination and the elimination of the mosquito vector from seaports are really our first lines of defense, and we owe a debt of gratitude to those countries which maintain it. The quarantine precautions at our borders, including the disinsectization of aircraft, and the immunization of travelers and airplane crews may be regarded as the second line. The third line of defense, and the one for which the responsibility rests on the local civilian health authorities, is the extermination of the domestic mosquito *Aedes aegypti* wherever it exists in the United States. General vaccination will be unnecessary in our civilian communities, since the measures here recommended are fully adequate. The suppression of aegypti can keep our communities non-infectible by yellow fever and also by that other aegypti-transmitted virus disease, dengue. Where dengue appears in our southern cities as occasional surprise epidemics, there yellow fever could also make its attack. Mosquito control is now well enough understood for it to seem inexcusable for communities to permit dengue outbreaks, just as in these times the presence of smallpox is looked upon as a sanitary disgrace.

TYPHUS FEVER

Of the rickettsial diseases, louse-borne typhus fever is the only one with a well earned reputation for spreading illness and death through troops and civilians in time of war. We can pass over the milder flea-borne typhus variant known as murine typhus, for it has long been endemic in the south-

eastern and southern states, where the scattered human cases are secondary to epizoötics in rats. It is perhaps not impossible that, under war conditions far worse than any envisaged for the United States in the present conflict, this existing endemic human infection might become louse-borne and epidemic. Likewise we can disregard in this discussion the rickettsial tick-borne Rocky Mountain spotted fever, the very name of which is derived from its principal location in this country. Another disease caused by rickettsiae deserves a word in passing. The mite-borne scrub typhus or tsutsugamushi disease of the Far East has a geographic distribution which includes present theaters of war, but its introduction by returning troops and its establishment here with a suitable vector seem unlikely, if not impossible. More needs to be known of this scrub typhus situation and the possibilities.

Unlike yellow fever, louse-borne typhus is not inhibited by cold weather and is most prevalent in late winter and spring. The vector concerned is the body louse, and the scarcity of this insect in the United States under present conditions is one of the reasons for a feeling of security against any serious invasion by typhus fever. Nevertheless, there are in our large cities vagabonds and people living in poverty and crowded quarters who are louse-infested and necessitate constant vigilance to prevent the introduction of lice into cheap rooming houses and public hospitals. In the past the prevalence of body lice has been revealed on various occasions by the presence of typhus fever, as in certain labor camps to be mentioned later and in an Indian reservation.[13] The head louse is still common but it plays at most only a minor rôle in typhus transmission.

The introduction of louse-borne typhus fever by returning troops would seem improbable. Even if louse-infestation did become prevalent in overseas units of the armed forces as in the last World War, a happening which we are disinclined to predict in the light of the improved methods of delousing, and if some of the troops, although vaccinated, became infected abroad with typhus, the return of soldiers ill with typhus along with the vectors, in spite of the vigilance of the military medical officers and the quarantine authorities, is almost unthinkable.

There are, however, other ways in which louse-borne typhus can enter this country in time of war and spread as far as the local louse-infestation will permit. In fact, a case of the sort was observed in the Southwest in 1916, when I had opportunity to follow the events as Secretary of the California State Board of Health. The episode had a double war relation. Civil war in Mexico had brought widespread poverty and distress and had prepared the ground for the typhus epidemics which flourished in the highland cities and spread northward to the border states, involving both soldiers and civilians. To escape these conditions many of the poorer people emigrated to the United States, principally at El Paso, Del Rio and Laredo in Texas. On our side of the border the first World War was already having its effect, although the country had not yet formally entered the conflict. Unskilled labor was scarce and the railroads found that the Mexican peons were the only available supply. Laborers were recruited by employment agencies among the refugees, chiefly in El Paso, and were shipped with their typhus and their lice in many directions to primitive and insanitary labor camps along the railroad tracks. Scattered outbreaks appeared where these laborers went in Arizona, Colorado, California, Iowa, Illinois, and Central and Eastern Texas.[14, 15] Some of the cases of typhus reported during 1916 and 1917

from New Mexico, Utah, Indiana, and Kansas may also have been produced in the same way. In Kansas the 2 cases reported were in a Mexican patient and a nurse in a railroad hospital.

In California typhus fever began to appear in the spring of 1916 in Mexican railroad section hands who had recently arrived. Although typhus fever had previously been practically unknown in the state, 31 cases were reported from June 1, 1916, to March 1, 1917, with 4 deaths. Of the first 26 cases investigated all except 2 were in railway employees, and all but 5 were in arrivals from Mexico. These 5 were classed as secondary,[14] but the relationship to cases in Mexicans was not clear in every instance. An investigation of 44 of the camps in October showed an infestation with body lice of 35 per cent and with head lice of 60 per cent. The outbreaks were quickly controlled and the influx of typhus was checked by the detention and delousing of laborers entering the state in temporary observation camps, by sanitation of the section camps, with improvement of bathing facilities, and by the systematic delousing of infested laborers at the Mexican border by the U. S. Public Health Service and within the state by the railroads under regulations of the State Board of Health. Since then, however, typhus fever, now classed as endemic and probably of the flea-borne murine type, although the 1916 outbreak was undoubtedly louse-borne, has been continuously present in California. There were waves of increased incidence from 1921 to 1924 and from 1936 to 1942, and according to Halverson [17] the total number of cases up to 1942 reached 229.

The experience in Iowa was reported by Boyd.[18] A louse-infested Mexican laborer who had been brought from El Paso about 7 days before and who had been out of Mexico for 2 months, was admitted to the railroad hospital in Fort Madison. From this patient typhus fever was contracted by the doctor who examined him, the nurse who took charge of his clothing, the male nurse who undressed and bathed him, a Mexican laborer who visited him before the diagnosis was made, and another Mexican laborer who shared his hospital room. A male nurse who was present when the last mentioned patient was deloused also contracted the disease. The 8th and last in this series of typhus cases was in a Mexican laborer admitted to the same hospital from Surrey, Ill., where he had been in contact with another Mexican laborer who had been in the Fort Madison hospital while the previous cases were there.

The present situation in the United States with respect to the risks of typhus introduction is quite different from the one in 1916. Mexico is free from civil war and there are no extensive typhus epidemics in that country, although the louse-borne disease is present. In this country, however, there are labor shortages on account of the war, much movement of people, and acute housing deficiency and crowding around war plants. The protection of civilians against introduced louse-borne typhus requires, as in the case of yellow fever, that every community be kept non-infectible. General vaccination of population groups would not be justified with the present low risk of exposure and would be less dependable than louse control. Adequate insurance against typhus epidemics must depend primarily on the destruction of the vector.

If a domestic mosquito like *Aedes aegypti* can be locally exterminated by organized inspection and the destruction of larvae, how much simpler it would be to exterminate the body louse, which is more than domestic—even strictly personal. The health officer with a louse infestation problem in a

civilian population needs effective methods for systematic inspection to establish infestation rates and check on results and also some simple and inexpensive way to free clothing of lice. Such methods are being devised and tried out and should in due time become generally available. There are two important elements in the methods giving the most promise for civilian use. They are, first, a highly insecticidal powder which is not toxic when in long contact with the human skin and, second, a system and organization for seeing that the powder is thoroughly applied to the clothing at regular intervals and for keeping close track of the degree of infestation. Satisfactory results have been obtained by Davis and Wheeler [19] with certain of the newer powders in delousing volunteers in a road builders' camp in New Hampshire after artificial infestation. A field study in five naturally infested Mexican villages was carried out by Davis, Malo Juvera, and Hernandez Lira [20] for the purpose of finding methods for ridding an entire town of lice cheaply, rapidly, and with a minimum of equipment. Powders were used to kill lice in the clothes, and a lotion to destroy those in the hair. In one of the towns typhus was present. Following treatment the disease disappeared and the number of persons with lice approached zero in the second week. It was evident that administrative measures and insecticides were at hand which, after perfection of details, could be depended upon by the health organization to keep people free of lice and consequently non-infectible by louse-borne typhus fever. It seems now that periodic disinfestation with elaborate equipment followed by prompt reinfestation may soon give way to effective methods for keeping the community continuously free of lice by locally exterminating them and by the same measures making reinfestation impossible.

The described episode during the last World War indicates that all that protected us from a widespread epidemic of typhus fever was the general freedom of the public from body lice. As a rule the disease showed no tendency to spread beyond the immediate contacts of the persons introducing it into the communities. There is no reason to believe that lousiness is any more prevalent now than then or that there is serious danger that anticipated war conditions here will bring about a great increase in these insects. Nevertheless, as a precaution, it is incumbent on health officials to search out and remove the few existing foci and thus give protection against the spread of epidemics of typhus either from introduced louse-borne disease or from the existing endemic foci of the murine variety.

The health officer is now in a position to remove all danger of the invasion of his community by yellow fever or louse-borne typhus by keeping it non-infectible in peace time and even during the risks and difficulties imposed by war.

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Public Health Implications of Tropical and Imported Diseases*

Imported Malaria

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MALARIA has been by far the major medical problem encountered by the Army overseas. The campaigns in New Guinea, the Solomons, and southern Italy are being fought in some of the most malarious regions of the world. In addition, many troops are stationed in or travel through such malarious regions as tropical America, equatorial Africa and India. As a consequence, large numbers of our troops are being infected with malaria. Even with proper treatment relapses of the disease are frequent and periods of latency may persist for months. In many malarious areas troops are given suppressive treatment with atabrine. In some of these individuals, initial clinical attacks may not appear until many weeks after medication is stopped. It appears inevitable that large numbers of our troops will be returned to this country infected with malaria. During the current year approximately 65 per cent of the cases of malaria reported in the Army in this country were acquired abroad. The number of cases in men returned from overseas may be expected to increase as the war progresses and, of course, will be greatly multiplied when the fighting ends and our armies are brought home to be demobilized.

The question arises as to what influence this influx of cases from abroad will have upon the malaria situation in this country. In the past the area of endemic malaria extended widely through the northern states. Although in recent years the area of endemicity has shrunk greatly, the potentiality for the re-introduction of the disease still exists in many parts of the country. Potential anopheline vectors of malaria are to be found in every state of the Union. In some areas, at present malaria-free, *Anopheles quadrimaculatus* may be quite numerous during the summer season. The chief problems of public health concern related to the return of cases of malaria from abroad may be summarized as:

1. The possibility of establishing new endemic foci of the disease in areas now free from malaria.
2. The introduction of new strains of the parasite in regions where malaria is already present, and a resultant increase in the amount of malaria in these areas.
3. Prompt recognition and proper treatment of relapses in soldiers after they have returned home on sick leave or furlough or have been discharged from the Army.

The first of these problems, the possible establishment of new endemic foci, has attracted the most attention. Exaggerated statements predicting dire

* Presented before a Special Session of the American Public Health Association at the Seventy-second Annual Meeting in New York, N. Y., October 13, 1943.

consequences have occasionally been published in the public press. Suggestions have been offered that troops returned from malarious areas should be segregated. In the North the point of view is that such troops should not be sent to northern states because these sections—malarious 100 years ago—are now free from malaria and it should not be introduced again. In the South the opinion prevails that infected troops should not be brought to southern states because in this part of the country conditions are most favorable for the spread of the disease. There is some merit in both points of view, but question may be raised as to whether either is really necessary.

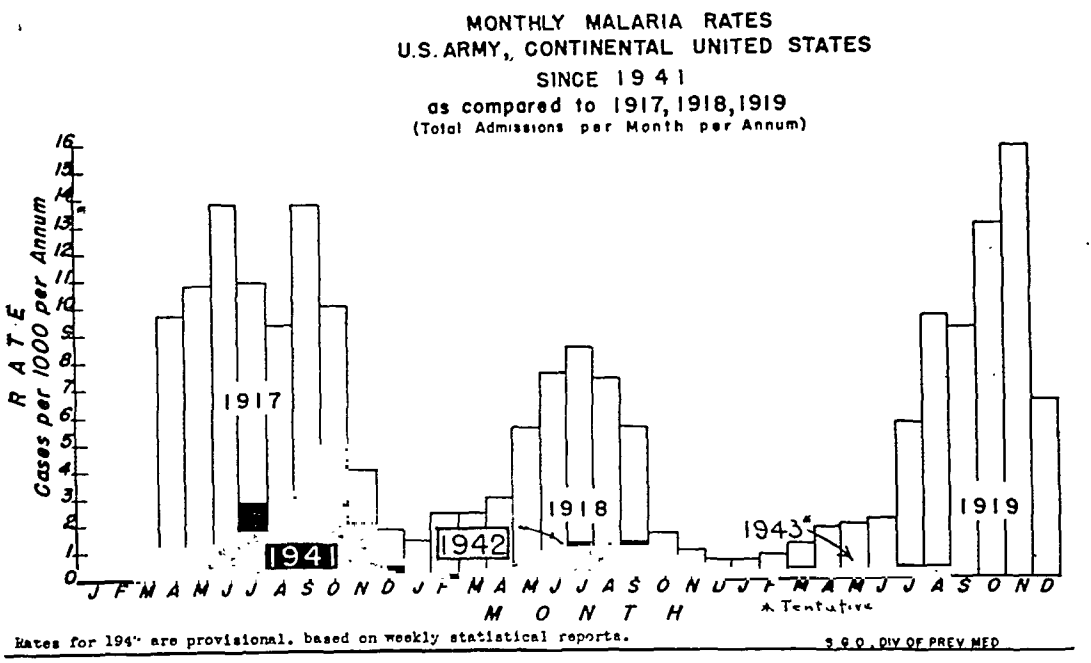
The practical difficulties of segregation are, of course, obvious. At present there are no certain criteria by which a case of malaria may be pronounced completely cured. Relapses may occur after many months of latency. It would certainly be impractical to attempt to deny furlough to returned soldiers for any such length of time.

Since the discovery of the mosquito transmission of malaria at the turn of the century, it has been demonstrated repeatedly that the most fruitful methods of malaria control are those directed against the mosquito vector. Methods designed to control the human reservoir of the disease are of decidedly lesser importance. In this country the accepted line of attack against malaria has been that against the mosquito vector. No attempt has been made to control the movement of human carriers of the disease. Up until the last decade thousands of infected immigrants from southern Europe were allowed to enter this country and to settle at will. Seasonal migration of southern agricultural workers to northern states has been encouraged. No untoward consequences in the malaria situation have resulted from this policy. There seems no good reason to take a different attitude toward soldiers who may be carriers.

Three years ago when the country began to rearm, steps were taken to deal with malaria at the large training camps in the southern states. It was decided that the Army would conduct mosquito control within the boundaries of military reservations and that the U S. Public Health Service would carry out control measures, when necessary, in a mile-wide zone surrounding the reservations. This plan was originally instituted to protect soldiers at military camps from acquiring malaria from civilians. But these precautions can also work the other way around—to help prevent spread of malaria from soldiers to civilians. For instance, certain Army general hospitals in malaria-free areas have recently received considerable numbers of cases of malaria from abroad. Concern was felt regarding the possible spread of the disease to surrounding communities. The organization for the Control of Malaria in War Areas, of the U. S. Public Health Service, has made mosquito surveys at such hospitals and has instituted control measures when indicated. Since many cases of relapsing malaria have occurred among prisoners of war, the same precautions are being taken in respect to internment camps. The effectiveness of control among troops in the continental United States is well illustrated by a comparison of the malaria rates in this war with those of the last war (Figure 1).

As long as soldiers remain under military control there should be slight chance of spread of malaria to civilian communities. The men live in well sanitated camps. When sick, they receive prompt medical attention. Proper screening of hospitals should prevent them from being bitten by mosquitoes during periods when gametocytes are most numerous in the blood.

FIGURE 1



The chief problem arises after soldiers have been discharged from the Army or return home on sick leave or furlough. When relapse cases occur in communities where there are anopheline mosquitoes these individuals may be a source of spread to others. It is well to consider how serious this danger is apt to be.

Outbreaks of malaria have occurred from time to time in nonendemic areas in the northern United States. In recent years there have been such outbreaks in southern Minnesota, eastern Iowa, northern Ohio, and in Camden, N. J. In the summer of 1943, an outbreak of 53 cases occurred at a small town in Illinois. The characteristics of these outbreaks are much the same. They have involved comparatively few cases, they have not tended to spread, and often have subsided without antimosquito measures. Unlike dengue, malaria does not tend to occur as an explosive epidemic. Even in localities where conditions are favorable for spread, the warning given by prompt recognition of early cases ought to allow the institution of control measures to prevent an extensive epidemic. It would appear reasonably certain that prompt action to control *Anopheles* mosquitoes will be sufficient to prevent serious trouble from any new foci of malaria which may occur. Where local authorities do not have the personnel, supplies, or equipment to conduct antimosquito work, the U. S. Public Health Service with its special organization for malaria control is prepared to give immediate help when asked to do so by the state department of health.

The second main problem to be considered is the introduction of new strains of malarial parasites in the present areas of endemicity. Undoubtedly this will happen. It is well known that inhabitants of endemic malarial regions acquire immunity to local strains but have little or no immunity against new strains introduced from other regions. The most feasible solution for this problem would seem to be an intensification of mosquito control

in the known endemic regions in this country. This procedure has the advantage of helping to reduce the amount of malaria already present, as well as to guard against any danger from the introduction of new strains. During the past few years malaria rates in the South have been the lowest ever recorded. Special efforts for mosquito control at this time might reasonably be expected to decrease and perhaps eliminate many areas of endemicity.

Another aspect of the general problem is the possibility that new strains of malaria introduced might be more virulent than those already present in this country. Although differences in virulence may occur, they apparently are not of sufficient magnitude to be of great significance. In recorded epidemics of malaria it has almost always been some change in the mosquito population that has been responsible. For example, in Brazil some years ago it was the introduction of a new vector, *Anopheles gambiae,* which is a more dangerous carrier than the species of anophelines normally present. In the Ceylon epidemic ten years ago it was the exceptionally great increase in the number of anophelines already present.

Over 90 per cent of the relapsing cases of malaria among returned troops are of the *vivax,* or tertian type. This species of parasite is much less apt to produce malignant infections than is *Plasmodium falciparum,* the subtertian or estivo-autumnal parasite which predominates in the tropics. Although it is more difficult to effect a permanent cure of *P. vivax* infections, this species can be considered less dangerous than *P. falciparum* as far as introduction into this country is concerned. In the past the most serious epidemics of malaria have always been caused by the *falciparum* parasite.

Probably the most important problem connected with the return of infected troops has to do with the individual soldier himself. Will there always be prompt recognition of malaria relapses in soldiers after they have returned to their home communities? In many sections of the North, physicians are not familiar with malaria, especially the estivo-autumnal type caused by *Plasmodium falciparum.* Failure to make a prompt diagnosis may be a serious matter in cases of malignant malaria. Prompt diagnosis of malaria cases is not only important to the patient but is also important for the timely institution of control measures if outbreaks of malaria should occur.

A program of education is needed to give practising physicians better knowledge of the diagnosis and treatment of malaria and other tropical diseases. Laboratory workers in many places require greater experience in the recognition of malaria parasites, and especially need training in the use of the thick film technic of diagnosis. Programs of special lectures and symposia on tropical medicine arranged by state and county medical societies will serve a useful purpose. Instructional articles in society journals, especially those local journals which usually reach every doctor in the community, may also be a helpful means of education. Many of the doctors now serving in our armed forces are acquiring extensive experience with tropical diseases. The return of these doctors to their home communities ought to exert a favorable influence on the practice of tropical medicine in this country.

DISCUSSION

During 1943, the majority of troops coming back to this country with malaria have been returned as patients. Most of them remain in military service. Comparatively few are permanently discharged. As already pointed out, the chief danger of spread of malaria from soldiers is after they have returned home. The time of the greatest hazard

will not come until after general demobilization. It may be expected that the demobilization of large-sized units will require a certain amount of time, some weeks at least. This will allow discovery of a considerable percentages of relapsing cases of malaria, particularly among those who have recently been taking suppressive treatment. It is possible that a serological test, such as the complement-fixation test, may be developed to the point where it can be profitably employed to screen out infected individuals who would be subject to relapse If this is done, however, the question would still remain as to how long these individuals should be kept under surveillance. At present there is no drug which is effective in curing latent cases. The discovery of such a drug would, of course, greatly simplify the whole problem.

Both the Army and the Navy are fully aware of their responsibilities in helping to prevent the spread of malaria by returning military personnel. Both services are maintaining close cooperation with the U. S. Public Health Service in considering proper means for dealing with the problem.

SUMMARY

Large numbers of troops returned from overseas are infected with malaria. At present more than 90 per cent of cases are relapses of the *vivax*, or tertian type. Although there is a hazard of the establishment of new foci of malaria in sections of the country now free from the disease, the chances of serious consequences from such introduction are not considered very great. Prompt antimosquito measures should bring about rapid control of possible outbreaks. Intensification of anopheline mosquito control is indicated in the present endemic areas in this country to lessen the hazard from the introduction of new strains of malarial parasites. The most important problem connected with the return of military personnel infected with malaria is to insure proper diagnosis and treatment of the relapses which may occur after the service men have returned to their home communities.

Public Health Implications of Tropical and Imported Diseases*

Public Health Aspects of Certain Other Diseases to Which Our Military Forces May Be Exposed

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THE title of this paper is purposely vague in order to afford an opportunity for a brief but broad survey of the diseases to which our military forces may be exposed in the world-wide conflict in which they are engaged. The world picture of the present distribution of our forces shows that they are in contact with native populations and pathogenic fauna and flora from the Arctic through the tropics of both hemispheres, and to the south temperate zone of the eastern hemisphere. Furthermore, the massing of large bodies of men in close contact with each other favors the spread among them of infections acquired from native populations.

The preceding papers in this symposium have dealt with three of the most important diseases to which our military forces are or may be exposed. It is the province of this paper to present briefly the degree of danger of importation of other so-called tropical diseases and parasitic infections, and the likelihood of their spreading and becoming endemic in this country. The chances of introduction and establishment of exotic diseases depends upon several factors. Acute diseases having a relatively short period of communicability are much less likely to be introduced than diseases of a chronic nature or long incubation period. Diseases requiring a specific intermediate host may be introduced but cannot become endemic unless favorable intermediate hosts are present or are introduced and become established. Carriers of cosmopolitan diseases may attain a high incidence in large bodies of troops and cause an increased incidence when demobilization brings them in contact with our civilian population. It is conceivable that strains of certain microorganisms with a higher degree of pathogenicity acquired abroad might produce more severe disease in the civilian population if transmission occurs. A few diseases already endemic in this country in localized areas may become more widely distributed by the dispersal of troops from the endemic areas to their homes.

From these generalities let us first consider the diseases of high incidence in other parts of the world which by their nature are least likely to present public health problems in this country. The acute diseases in this group beside those already considered in this symposium are plague, cholera, dengue fever, and phlebotomus fever. We already have a plague problem in this country in the wild rodents of the

* Presented at a Special Session of the American Public Health Association at the Seventy-second Annual Meeting in New York, N. Y., October 13, 1943.

western states which is of considerable concern to our public health authorities, but the war should have little effect on this problem. We have a moderately protective vaccine for use in our forces which may be exposed to the disease abroad, and there should not be any new introduction of infected rats to port cities unless some disaster breaks down our highly efficient inspection of ships.

We also have a moderately effective vaccine against cholera, which will be used in the event of probable exposure of military personnel. With the advance of our forces into the endemic area of Burma, where the bombing of cities and the retreat of the enemy may lead to native epidemics, cases may occur in our advancing troops, and it is conceivable but improbable that a few carriers of the vibrio might harbor it until they return to this country. Such a possibility is mentioned only to keep it in mind.

Dengue fever is endemic not only in the eastern hemisphere but in the American tropics. It may cause disabling epidemics in the armed forces to the detriment of military progress. Owing to its short period of communicability it will probably be introduced again into the United States only from nearby Latin America. The threat of future epidemics in our southern states will not be removed until we accomplish the eradication of the mosquito vector, *Aedes aegypti,* as our neighbors in Brazil have done.

Phlebotomus fever, another disabling disease of very short duration, is not likely to be introduced into this country because the phlebotomus fly occurs here in only a few limited areas, and its breeding habits and short range of flight make the importation of new species a practical impossibility.

The chronic diseases which are not now endemic in this country or are present only in limited areas, and which are not likely to spread or become endemic, include a wide range of bacterial, spirochetal, protozoan and helminth infections.

Leprosy, endemic in restricted areas of Louisiana, Texas, and Florida, still presents a minor epidemiological problem, but probably will never spread beyond its present confines. A few infections may be expected to occur in individuals who come into unduly intimate contact with natives in the Orient, and these may develop clinical manifestations years after they return home. Past experience indicates that such cases will not give rise to others in this country.

Yaws, another disease transmitted by intimate contact, should not be expected to appear in our military forces, but if it does it will undoubtedly be recognized and cured where it occurs.

The chronic protozoan diseases, aside from malaria and amebiasis, are caused by the blood flagellates—Leishmania and the trypanosomes. The leishmanias are transmitted by phlebotomus flies. The visceral disease, kala-azar, is endemic in the Mediterranean littoral, the Sudan, northeastern India, northern China, and northeastern Brazil. The Old World cutaneous form is endemic in northern Africa and the Near East as far as northwestern India. The New World cutaneous form is endemic in the northern half of South America, Central America, and some of the West Indies. A few cases of all three forms may occur in the armed forces, but will present only problems of diagnosis and treatment. They cannot become endemic in this country in the absence of the vector.

African trypanosomiasis, caused by *Trypanosoma gambiense,* occurs in that part of equatorial Africa where American and Allied forces have been stationed, and along routes of air transport. Isolated cases may occur in our troops and may not develop clinical symptoms until they return to this country. The

tsetse fly vector does not at present occur outside of Africa, but two specimens have been found in commercial airplanes reaching Brazil from Africa.[1] This indicates the necessity for rigid inspection and thorough spraying of both military and commercial planes after intercontinental flights, even though it would require a peculiarly favorable combination of circumstances to establish both the fly and the disease in the American tropics.

A few cases of American trypanosomiasis, caused by *Trypanosoma cruzi*, may occur among our troops stationed in South or Central America, but the infection is usually subclinical or mild in adults. It is already present in certain wild rodents and cone-nosed bugs in California, Arizona, and Texas, though no naturally infected human cases have yet been found in this country. One human case, produced experimentally from a naturally infected bug in Texas has recently been reported,[2] indicating that naturally infected human cases may occur. It is not likely, however, to become a serious problem.

Many helminthic infections of great clinical importance in extensive or restricted areas of the world may be encountered by our military personnel. Most of these are likely to produce only sporadic cases which will be problems of diagnosis and treatment, though subclinical cases may return to this country and raise the question as to whether the disease may become endemic.

Among the trematodes, the schistosomes are the most important. They infect man by penetration of the larvae through the skin after immersion in water containing infected snails. Individual infections may be acquired by bathing in or wading, fully clothed, through infected streams or ponds, or even from infected water piped to camps for bathing purposes without adequate chlorination. It is reported by a German investigator[3] that the usual sand filtration of water will not remove the larval forms. It is conceivable that our troops campaigning in the Celebes or Central China may become infected from immersion in streams, lakes, or canals. There is great specificity of the snail intermediate hosts of these worms and it is not known whether species which could act as intermediate hosts exist in the United States. The possibility, however, is indicated by the fact that schistosomes of lower animals, whose larvae give rise to an acute dermatitis in man, are endemic in this country, and research is desirable to determine whether possible intermediate hosts of human schistosomes are also present. The importation of farm labor into this country from endemic areas of *S. mansoni* in Puerto Rico and other West Indian islands emphasizes the desirability of such studies.

The other trematode infections of man are acquired by eating raw fish, crustaceans or water plants, and should not be encountered in our military forces.

Among the tapeworms there are only three to be considered. *Taenia solium*, the pork tapeworm, is practically unknown in this country. It may be acquired by eating insufficiently cooked native pork in regions where medical inspection is not required. Its importance is mainly clinical, because the larval stage may develop in man, causing fatal infestation of the brain.

Echinococcus, the dog tapeworm, which produces larval cysts in man, is a common human infection in northern and southern Africa, the Near East, and Australasia. In Iceland strict control measures have reduced the formerly high incidence. Man becomes infected from close association with dogs. It is possible that a few infections may be acquired by our military forces. In certain parts of the United States the infection is common in hogs, but for

some unexplained reason is uncommon in man. It is not likely to become a human problem in this country.

Diphyllobothrium, the broad fish tapeworm, is acquired only by eating certain insufficiently cooked fresh-water fish. It is widely endemic in Europe and Asia but its method of transmission limits it to certain racial and religious groups. It is already endemic in our north central states, and a recent report indicates a possible endemic focus in Florida.[4] It is improbable that new infections will be introduced by returning troops.

Among the intestinal nematodes, hookworm is the only important infection to be considered. Since our troops are not likely to go barefoot even in the jungle, the only possibility of their acquiring the infection is by lying, insufficiently clothed, in infected soil during active campaigns. Although the hookworm in this country has been attacked rather tardily in some of the heavily endemic areas, the prospect of reducing it to negligible proportions should follow continuation of vigorous control measures in the post-war period.

Lymphatic filariasis, caused by *Wuchereria bancrofti*, is the chief nematode problem facing the armed forces at the present time. The infection has a practically world-wide, though spotty, distribution in the tropics, and is particularly prevalent in native populations in the East Indies and parts of southern Asia. A considerable number of infections have already occurred among military personnel quartered close to native populations in the Pacific Islands. Repeated infection is required to produce elephantiasis or other permanent deformities, and the female worms require about a year to become adult and begin discharging larvae into the lymphatics and blood stream. The first symptom of infection, however, is acute localized lymphangitis, beginning about 6 months after infection when the worms are still immature. The cause of the lymphangitis is still in doubt, but it incapacitates the patient for days or weeks and usually recurs at frequent intervals for months or years. Since the disease is transmitted by a variety of mosquitoes, the chief of which are the common night-biting Culex species of world-wide distribution, breeding close to human habitations, prevention of infection has made little advance in most endemic areas. In the United States the only endemic area has been in and about Charleston, S. C., but a recent report[5] indicates that the parasite may have disappeared from this area. Since heavy infections and massive exposure to mosquitoes are necessary to establish and maintain an endemic area, it is highly improbable that returning troops will create any new foci in this country. The problem in the military personnel is primarily one of treatment of the recurring lymphangitis. No effective chemotherapeutic agent has yet been discovered, but it is hoped that research now under way will produce a cure for this disabling disease.

Bacillary dysentery is of great concern to military forces, not only in the tropics, but in temperate zones. It was a scourge in every war in which this country has been engaged until the first World War, and even then severe epidemics occurred in the American Expeditionary Force in France, and it was the commonest cause of illness in non-combatant troops stationed in the Philippines. It was a severe handicap to the military operations of the British in southeastern Europe and the Near East. In the present war it has caused epidemics in army camps in this country and has had a high incidence among British troops in the North African campaign. Whenever epidemics occur, a high incidence of symptomless carriers of dysentery bacilli can be found

in contacts living under the same conditions as the cases. A small proportion of cases and symptomless carriers become chronic carriers and give rise to future spread. Although an apparently protective toxoid has been prepared from the soluble toxin of the Shiga strain,[6] this will probably be effective only against Shiga infections, and no protection can be expected against the Flexner and other strains of the organism. Protection of the military forces must depend entirely upon sanitary food handling and excreta disposal, safe water supplies, and control of flies. Individual instruction of troops and enforcement of sanitary discipline, though difficult, must become a part of military operations. The great effectiveness of the sulfonamide drugs in the treatment of bacillary dysentery should reduce the number of chronic cases and carriers. These drugs can also be used in smaller doses for the prevention of active cases among contact carriers in the presence of an epidemic. This has already been demonstrated in mental hospitals as well as in a military unit.[7] The only possible danger of spreading the disease in this country from returning military personnel would be from the introduction of highly pathogenic strains which might be transmitted to families, institutions, or military camps in the presence of bad conditions of sanitation or personal hygiene.

Amebiasis, of which amebic dysentery and liver abscess are relatively infrequent clinical manifestations, is also a cosmopolitan infection widely prevalent in this country, but giving rise to more frequent and severe symptoms in many tropical and unsanitated regions. Recent experiments indicate that the cysts of *Endamoeba histolytica* are not all destroyed by the concentration of chlorine ordinarily employed for the production of potable water,[8] and that insufficient depth of sand and too rapid filtration in mechanical filters may allow cysts to pass through. The opportunities for drinking contaminated water in forward military zones, as well as the contamination of vegetables, the presence of flies, and exposure to native food handlers in most tropical areas, greatly increases the chances of infection of military personnel. Although reports indicate that amebic dysentery and liver abscess have not thus far occurred with great frequency among our forces at home or abroad, circumstances in newly invaded areas may cause the disease to become more important. There is good evidence that strains of *Endamoeba histolytica* differ in the frequency with which they produce clinical symptoms and in the severity of the symptoms, and that highly pathogenic strains are more common in certain areas or in epidemics such as that in Chicago in 1933.[9] For this reason the introduction of strains from the tropics must be considered a potential hazard. Moreover, this infection often has an extremely long incubation period, or may become chronic in unrecognized or insufficiently treated cases, thus exposing families or larger groups under circumstances of defective sanitation. In the protection of our forces from amebiasis the same rigorous discipline is necessary as for the prevention of bacillary dysentery, with the additional requirement that improved methods are necessary for the elimination of cysts from military water supplies in forward areas.

Typhoid fever fortunately presents no great problem to the military forces owing to the efficacy of the vaccine. Although a few cases will almost certainly occur from insufficient protection against massive infections, it is not likely that a sufficient number of carriers will be produced to create a hazard from returning personnel.

There remains one fungus infection endemic in this country, but rarely encountered elsewhere, which deserves

brief consideration. This is coccidioidomycosis which is endemic in California, particularly in the San Joaquin Valley, and in Arizona and Texas.[10] Since infection is usually acquired by the inhalation of dust in dry, sandy regions, military forces training in endemic areas are exposed to infection.[11] Fortunately, many infected persons seem to develop immunity without clinical symptoms, and the primary clinical infection in the lungs usually resolves permanently without the later general dissemination which is often fatal. The possibility of a rodent reservoir of this infection and the ability of the fungus to survive in a dry state make prevention a difficult problem for those who reside in endemic areas. It would seem wise for the military forces to determine whether or not the infection is present before establishing training areas in arid regions, and to remove installations which have already been established in infected areas. Fortunately it is probable that this fungus cannot be disseminated easily except in dry regions, and it is improbable that it will extend much beyond its present confines unless it is carried by dust storms, vehicles, or rodent reservoirs. Since transmission from man to man has not been observed, it is practically impossible for the infection to be transported by our military forces to other countries.

SUMMARY

A review of the diseases to which our military forces may be exposed in the present world conflict indicates that very few diseases of foreign origin are likely to present public health problems as the result of infections introduced by returning troops. A few cases of acute or chronic diseases such as plague, cholera, leprosy, yaws, leishmaniasis, trypanosomiasis, schistosomiasis, or other helminth infections may occur among troops coming into close contact with native populations. Dengue and phlebotomus fever may cause brief but incapacitating epidemics. Filariasis may incapacitate a considerable number for future military service in the tropics, but is not likely to develop new endemic areas in this country. Bacillary dysentery is a constant threat to effective military operations, and its prevention requires strict military and sanitary discipline. The only danger to this country from bacillary dysentery and amebiasis is the possibility of the introduction of new strains of organisms which might give rise to more serious infections in our civilian population. The fungus infection coccidioidomycosis, endemic in certain arid regions of our western states, presents an immediate problem of infection in troops under training, but is unlikely to become a problem of civilian populations very far outside of its present endemic areas. In short it may be stated with considerable confidence that the chief hazards in the importation of exotic diseases are from the introduction of new strains of parasites already present, and the introduction of new vectors of disease. The Army, Navy, Public Health Service, and the medical schools have instituted better instruction in tropical medicine, and thousands of medical officers are gaining practical experience with the armed forces. Through a better understanding of tropical medicine by the medical profession, by the expert training of laboratory personnel, and by the continued development of alert national, state, and local public health services, there is little danger that the present war will result in the serious dissemination in this country of diseases which would not occur in times of peace.

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Symposium on Cancer Regarded as Successful

Morton L. Levin, M.D., the Assistant Director of the New York State Division of Cancer Control, Albany, who is serving as Secretary of the Cancer Symposium Committee, reports that the Cancer Symposium arranged at the 72nd Annual Meeting of the American Public Health Association by an informal group attracted an attendance of more than 300 persons on October 11. According to Dr. Levin, at least 16 states and 45 institutions or organizations were represented.

An informal Cancer Committee was reappointed by the group following the meeting, composed of the following persons:

Herbert L. Lombard, M.D., *Chairman*
Morton L. Levin, M.D., *Secretary*
Lauren V. Ackerman, M.D.
Raymond V. Brokaw, M.D.
Thomas J. Duffield
James W. Hawkins, M.D.
Clarence C. Little, Sc.D.
J. Louis Neff
Edmund Zimmerer, M.D.

Immunizations in the United States Army

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INFECTIOUS diseases have always played a significant rôle in the prosecution of wars. Such diseases have, in all major conflicts of the past, been responsible for more deaths and disabilities than have the injuries of battle. In reading the histories of our past campaigns, it is gratifying to note that there has been a progressive improvement in the care afforded the sick and wounded. Improvement in the effectiveness of measures designed to prevent diseases have, however, developed somewhat more slowly. In the Mexican War, disease caused seven times as many deaths as did battle. In the Civil War, the ratio was about two deaths from disease to one from battle injuries. At the time of the Spanish-American War, while information was available about many of the microorganisms of disease, military sanitation and hygiene were as yet not well developed. Consequently, again seven men were lost from disease to every one killed in battle. One of every five men developed typhoid fever, and this disease, now fortunately largely preventable, resulted in 80 per cent of the total deaths.

During World War I, the advances that had been made in the control of infectious diseases were applied effectively in military preventive medicine. During that great war, the number of men lost from battle injuries and those dying from disease were almost equal. The major problems were those presented by the respiratory diseases, particularly influenza.

The problems of disease prevention in the present war are undoubtedly the greatest with which our Army has ever been confronted. With what success these problems will be met is impossible to say at this early date. The record up to this time is good.[1] It is sincerely hoped that this record can be maintained and improved. To this end, every effort is being made by the Medical Department to apply effectively the best methods and procedures for the prevention and treatment of disease.

In this discussion, only one aspect of these activities will be considered—the prevention of disease by means of immunization. The regular immunization procedures available for troops during the last war were essentially limited to vaccination against smallpox, typhoid fever, and the paratyphoid fevers. Today there are six active immunizations which are being administered more or less routinely, and other procedures which may be used under certain circumstances.

For administrative purposes, these immunizations have been divided into two classifications: the so-called "routine" immunizations, and the "special" immunizations.

* Presented before the Laboratory Section of the American Public Health Association at the Seventy-second Annual Meeting in New York, N. Y., October 12, 1943.

ROUTINE IMMUNIZATIONS

The routine immunizations are those administered to all military personnel as soon as possible after entrance into the federal service. These are vaccinations against smallpox, typhoid fever, and the paratyphoid fevers, and active immunization against tetanus.

SMALLPOX VACCINATION

Smallpox vaccination was, of course, the first immunization to be practised in the United States Army. It was used on a small scale during the War of 1812 and the Mexican War, and somewhat more extensively during the Civil War. Universal vaccination of troops was adopted in our Army at the end of the last century. Since that time, vaccination of all military personnel has been rigidly enforced and the occurrence of smallpox is so rare as to be almost nonexistent. This is not surprising. It is merely another example of the results of complete vaccination of a population and serves to emphasize once again that epidemics of smallpox need not occur.

Glycerinated calf dermo vaccine is the agent utilized for smallpox vaccination. The method recommended is that commonly known as the multiple pressure method, and, of course, the use of dressings of any kind over the vaccinated area is avoided. Smallpox vaccination is repeated every 3 years unless it is known that there has been exposure to cases of the disease or that such exposure is likely to occur. In these instances, it is considered more practical to vaccinate all of the contacts than to attempt any sort of selective vaccination.

Occasionally the question is asked as to whether or not the possible exposure of troops to highly virulent forms of smallpox will require their vaccination with a more potent strain of vaccinia virus than that commonly used. This is not considered to be necessary. It is believed that adequate protection can be afforded by the maintenance of a high level of immunity through frequent vaccinations. In this connection, it is important to recognize that a primary type of reaction is not necessary for the stimulation of immunity. An increase in the level of immunity is also afforded by vaccination resulting in a vaccinoid or accelerated reaction or in an immune reaction.

TYPHOID VACCINATION

Typhoid vaccination is, of course, one of the routine immunization procedures. Stimulated by the experience with typhoid fever in the Spanish-American War, General F. F. Russell in 1908 developed an improved type of typhoid vaccine, the use of which was made compulsory in the Army in 1910. Paratyphoid A and B microörganisms were added to the vaccine during the first world war, and its use together with the improvement in methods of sanitary control practically eliminated typhoid fever. It has been estimated that if the Army typhoid rates of 1898 had obtained during World War I, there would have been a half million cases and more than 50,000 deaths from typhoid. As it was, there were less than 2,000 cases and only about 200 deaths among 4,000,000 soldiers. It is encouraging to note that since the present mobilization began in 1940, the incidence of typhoid fever has been negligible.

During the peacetime years following the first world war, the paratyphoid organisms were dropped from our vaccine and routine vaccination in the Regular Army was accomplished by a monovalent typhoid vaccine. In 1936 the Rawlings strain of *Eberthella typhosa* was discontinued and the smooth virulent Panama 58 strain was substituted. It is this strain which is currently used in the manufacture of typhoid vaccine for use in the Army. At the beginning of the present

emergency, the triple typhoid vaccine was re-adopted. This vaccine, which is manufactured at the Army Medical School, Washington, D. C., is standardized to contain in each ml. 1,000 million *Eberthella typhi* and 250 million each *Salmonella paratyphi* and *Salmonella schottmuelleri*. The initial vaccination consists of three subcutaneous injections at intervals of 7 to 10 days. The first dose is 0.5 ml. and the second and third doses are 1 ml. each. Immunity is maintained by the subcutaneous administration of 0.5 ml. of the vaccine each year. A similar dose is administered in the event of actual or potential exposure to typhoid or paratyphoid fever.

TETANUS IMMUNIZATION

The use of tetanus toxoid for active protection against tetanus is the third immunization routinely employed. The early experience in the Army with the use of this material was reviewed last year.[2] At that time, it was stated that since the adoption of this procedure only 4 cases of tetanus had been reported from the entire Army, and that none of these cases were in immunized individuals. It is gratifying to be able to bring the record up to date by the addition of only 5 more cases, 3 of which had received no tetanus toxoid. Of the 2 who had received toxoid, 1 had been given four injections, the last about 3 months prior to his injury, a compound fracture of the tibia. The other had received three injections, the last about 7 months prior to a gunshot wound in the abdomen. Neither of these wounds was a battle injury and neither patient received his initial treatment in a U. S. Army hospital.

In the first case, an emergency stimulating dose of toxoid was not administered, and symptoms of tetanus developed about 10 days after the injury. Response to therapy was satisfactory and the patient recovered.

In the second case, the emergency dose of toxoid was administered on the 2nd day following the injury. On this same day the first symptoms of tetanus were noted. Following this unusually short incubation period, this case terminated fatally about 12 hours after the onset of muscle spasm, despite sedation and large doses of antitoxin. It is unfortunate that an autopsy was not performed, since certain unusual features of this case suggest the possibility that a condition other than tetanus might have been the cause of the symptoms and death.

There has, then, been a total of only 9 cases of tetanus reported from the Army over a period of almost 2½ years. None have been reported following battle injury, and only 2 occurred in individuals who had completed their initial series of toxoid.

The method used for immunization is the administration of plain or fluid tetanus toxoid in a series of three subcutaneous injections of 1 ml. each at intervals of 3 weeks. Under ordinary circumstances, a single stimulating dose of 1 ml. is administered at the end of the first year after the initial series. Another 1 ml. dose is administered prior to departure for a theater of operations, unless such departure is within the 6 months' period subsequent to the administration of a previous dose. An emergency stimulating dose is administered upon the occurrence of wounds or severe burns on the battlefield, or at the time of secondary operations or manipulations of old wounds, or at any other time when danger from tetanus is considered to be a possibility.

The apparent clinical efficacy of this method of immunization would appear to corroborate laboratory evidence which has indicated that the method affords a maximum of protection.[3]

With the removal of certain offending peptones from the culture medium used in the manufacture of the toxoid, the

reactions of sensitivity previously reported have apparently almost ceased to occur. It is still considered, however, that in the preparation of materials of this type, the simplest medium affording the production of a potent and stable antigen should be used.

SPECIAL IMMUNIZATIONS

Those procedures referred to as special immunizations include vaccination against yellow fever, typhus, and cholera.

YELLOW FEVER VACCINATION

In view of the existence of yellow fever, particularly the endemic or jungle type of the disease, in certain areas of the world, it is fortunate that there has been made available an effective vaccine against this disease. While much can be done, time and the general situation permitting, to control and prevent the occurrence of the so-called urban type of yellow fever, the challenge presented by the jungle form is much more formidable and under some military conditions might well be impossible to meet.

The yellow fever vaccine now being used is prepared from chick embryo cultures of the 17D strain of virus.[4] The finished vaccine is placed in ampules, then is rapidly frozen and desiccated. The ampules are then sealed and stored at freezing temperatures.

The dose is 0.5 ml. of a 1:10 dilution of the frozen and dried material. Immunization is accomplished by the administration of a single dose. Immunity is developed within 1 week to 10 days following vaccination and is considered to last for at least 4 years in adults.[5, 6] This protection is given to personnel travelling to or through or stationed in areas where yellow fever is endemic.

While information concerning the degree and extent of exposure of United States military personnel to yellow fever is not available at this time, it is possible to report that no cases of the disease have been reported from our troops.

The outbreak of jaundice in the Army and its relation to yellow fever vaccination has been reviewed elsewhere.[7] Further reports of the investigations pertaining to this episode will soon be published. For the purpose of this discussion, a brief summary of certain features of this complication of yellow fever vaccination will suffice.

The increased incidence of jaundice in the Army began in March, 1942, and the peak was reached before the end of June. The outbreak had completely subsided by September, and since that time no more than the commonly expected incidence of jaundice among troops has been reported. The clinical course of the disease presented a strikingly uniform pattern in the great majority of patients. The disease resembled most closely so-called catarrhal jaundice or epidemic hepatitis of unknown etiology. The case fatality rate, based upon reported admissions to hospitals, was approximately 0.2 per cent.

Recovery usually occurred in 4 to 8 weeks and was complete in the vast majority of cases. A variety of diagnostic terms were applied to this disease. These included: jaundice without known cause, catarrhal jaundice, infectious hepatitis, epidemic hepatitis, cholangitis, obscure jaundice, yellow jaundice, and postvaccinal hepatitis. Exhaustive epidemiological and laboratory studies resulted in only negative evidence as far as demonstration of the transmissible agent of the disease is concerned. These negative results, however, have served to exclude a number of infectious diseases in which jaundice occurs. The outbreak of jaundice in the Army was not Weil's disease or any other type of leptospiral infection. It was not a bacterial in-

fection and had no relation to infectious mononucleosis. The disease was not yellow fever, nor a modified form of yellow fever. Yellow fever virus has not been recovered from any material (blood, bile, urine, liver, etc.) from jaundice patients.

Certain special features of the occurrence of jaundice among troops form the basis for the conclusion that this outbreak was a type of jaundice following the administration of certain lots of yellow fever vaccine, and that the disease was not contagious in the ordinary sense, and hence did not constitute a danger to public health.

When it appeared likely that the jaundice was associated with vaccination against yellow fever, the vaccine then in use was discontinued. On the assumption that the human serum component of certain lots of vaccine may have carried an icterogenic agent, the vaccine used since that time has been prepared without human serum, and more than a year has now elapsed since any unusual incidence of jaundice has been reported.

Further evidence that the icterogenic agent was carried by the human serum has recently been reported,[8] and there is every reason to believe that the use of yellow fever vaccine produced without the addition of human serum has eliminated the danger of jaundice following its administration.

TYPHUS VACCINATION

Typhus vaccine is also administered to troops under certain conditions. Typhus fever, has, since ancient times, been a disease of the greatest military significance. For its control, sanitary measures are of paramount importance. These measures are, of course, directed toward the prevention of lousiness among troops. For this purpose, highly effective insecticidal agents have been developed and improved methods for the disinfestation of clothing, bedding, etc., have been adopted. In addition, typhus vaccination is required for all military personnel who may come in contact with this disease. It is believed that the vaccine now being used is the best ever developed. It is administered in three doses of 1 ml. each, with intervals of 7 to 10 days between injections. A stimulating dose of 1 ml. of vaccine is given every 4 to 6 months, or at the discretion of the responsible medical officer in the presence of danger from infection.

The conditions under which typhus vaccination has been practised in the Army have not permitted a well defined evaluation of its efficacy. Vaccinated troops have, however, operated in areas where typhus was epidemic and very few cases have developed. Of the cases that have occurred, many have been so mild as to have required special laboratory studies for their diagnosis, and the case fatality rate has been extremely low. From these observations, it is evident that typhus fever has not as yet been a problem of any magnitude. While it is too early to predict what the ultimate experience with this disease will be, it may be said with some confidence that vaccination and the other anti-typhus measures being applied afford to the troops the maximum protection available.

CHOLERA VACCINATION

The third special immunization procedure is vaccination against cholera. This disease is now largely confined to endemic and epidemic centers in Asia. In some regions of that large area, cholera continues to be a public health problem of great importance. The disease, of course, has not always been limited to that part of the world, but has on occasion been much more widespread. Epidemics were experienced in America in the last century and as late as 1911 the disease reached the port of New York. During World War I, it

occurred in Russia, Austria, Hungary, Germany, and Italy.

In certain situations cholera could become a real menace, and danger from this disease cannot be disregarded. For its prevention, chief reliance must be placed on the sanitary control of food and water. As an added safeguard, cholera vaccination is now required for all military personnel stationed in or traveling through Asia, and provisions have been made for the vaccination of troops in other areas where danger from this disease may develop.

The vaccine now being distributed for use in the Army consists of a suspension of 8,000 million killed cholera vibrios per ml. Two East Indian strains of high virulence and stability are used in the manufacture of this vaccine. It is administered in two doses at 7 to 10 day intervals. The first dose is 0.5 ml. and the second dose, 1 ml. The present policy is to administer an additional 1 ml. dose every 4 to 6 months in the presence of danger of infection.

The degree and duration of immunity established by this vaccination is still not fully determined. Experience in the Far East by the British and others indicates, however, that a sufficient degree of protection is afforded to make its use advisable.

OTHER IMMUNIZATIONS

Vaccination against plague is another procedure for which provisions have been made. Again, as in typhus and cholera, sanitary measures are stressed for the prevention of plague, and it is believed that in the majority of instances these measures will prove to be adequate protection. Plague vaccine is not now routinely administered to troops, but is supplied to forces in those areas where danger from the disease may be confronted. While there is little well controlled experience with the use of this material, it is felt that if the need arises, vaccination may prove to be a valuable aid in the prevention of this time-honored menace.

The vaccine provided consists of a suspension of 2,000 million killed virulent plague bacilli per ml. The plan of administration is to give two initial doses approximately 1 week apart; the first dose to consist of 0.5 ml. and the second dose 1 ml. Stimulating doses may be administered at the discretion of the medical officer.

Immunization against such diseases as diphtheria and scarlet fever is not routinely practised, but materials are made available for use if the situation should require artificial protection against these diseases. The material provided for immunization against diphtheria is fluid diphtheria toxoid, to be administered in three injections of 0.5 ml., 1 ml., and 1 ml. respectively at intervals of approximately 3 weeks. Since reactions to diphtheria toxoid are not uncommon in adults, particularly those who demonstrate the combined type of reaction to the Schick test, it may be necessary to alter this scheme of administration to suit the individual case. In any event, it is felt that only those individuals who are shown by the Schick test to be susceptible to diphtheria should be immunized.

Scarlet fever streptococcus toxin is supplied for scarlet fever immunization but is administered only under special circumstances. In general, its use is confined to the protection of nurses, ward attendants, and others in close association with the disease. As with diphtheria toxoid, the reactions attending the administration of streptococcus toxin to adults require special care in its use.

PASSIVE IMMUNIZATION

The foregoing discussion has been concerned with the use of antigenic agents for the development of active immunity to certain infections. In addition, there are utilized to a con-

siderably less extent materials providing pre-formed antibodies and antitoxins for passive protection.

Tetanus antitoxin is provided in 1,500 unit doses to be used prophylactically in those rare cases in which previous conditioning by tetanus toxoid is in doubt.

A bivalent antitoxin is also available for protection against gas gangrene. This material is administered to those cases which, in the opinion of the surgeon, require its use. The prophylactic dose contains 10,000 units each of perfringens and vibrion septique antitoxin.

The utilization of human immune serum and human globulin (placental extract) for the protection of individuals or groups known to have been exposed to such infections as measles or mumps is not considered practical for general application in the Army. Consequently, the use of such material has been limited largely to those instances where, for military or medical reasons, it has been absolutely imperative that all chances of infection be avoided.

NEW IMMUNIZING AGENTS

The materials and methods currently employed in the Army for specific protection from infections have been summarized. As new agents are developed and their value demonstrated, they will undoubtedly be adopted if a need for them exists. Among such materials now being studied, and concerning which the Medical Department has a keen interest, are influenza vaccine, gas gangrene toxoid, and dysentery vaccine.

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Experience with the Administration of a Medical Care Program for Wives and Infants of Enlisted Men*

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THE recent appropriation by Congress of $18,600,000 for emergency maternity and infant care for the wives and infants of enlisted men in the fourth to seventh pay grades of the armed forces has put the program on a basis that should give assurance to the men in the forces, to their wives at home, and to those who administer the program, that there will be no interruption in this service. The discussion in Congress has made it clear that it is the present intention of Congress to provide sufficient funds to carry the program forward throughout the war.

The enthusiasm with which it has been received by the wives of the men and by the men in the Army has fully justified the effort that it has meant for administrative officers, physicians, nurses, and hospital administrators. The purpose of the program as declared by Congress is twofold: To relieve the wives of the enlisted men of worry as to how they can get the necessary maternity care for themselves and medical care for their infants regardless of their place of residence, and to reassure the enlisted men themselves that their wives and infants will have this care in their absence. The sense of security thus developed will assuredly improve the morale both at the fighting front and on the home front.

When making the initial appropriation of $1,200,000 for this program in March, 1943, and again when augmenting it with funds for the current fiscal year now amounting to $23,000,000, the Congress showed its very great interest in providing all necessary medical, nursing, and hospital care for the wives of the enlisted men and for their infants. The administration of the program was entrusted to the state health agencies already responsible for the maternal and child health aspects of the Social Security Act. The appropriation act specified that state plans were to be developed and administered by the state health agencies and approved by the Chief of the Children's Bureau. Good public policy required that the administration of this program as of others involving the expenditure of public funds should be by public agencies.

There was thus placed upon the state health agencies responsibility for a medical care program that will involve, before the war is over, care of many hundred thousand mothers and children. For the first time, state and local health departments are carrying out programs of maternity and infant care that reach out into every county and municipality, that are as widespread geographically as the draft of

* Presented before the Maternal and Child Health Section of the American Public Health Association at the Seventy-second Annual Meeting in New York, N. Y., October 13, 1943.

enlisted men under the Selective Training and Service Act of 1940. Fortunately, during the previous 8 months 30 state health agencies had already started programs of maternity and infant care for enlisted men's wives and children under the provisions of title V of the Social Security Act, and a small body of experience was available on which an expanded program could be built. During this period some 6 thousand wives and infants were given care and basic procedures were developed. The experience of many state health departments in the administration of the crippled children's program should not be forgotten in this connection, for from it, as from the special maternity care demonstrations started in 1939 and 1940, much of value to the present emergency program had been learned.

Once the intention of Congress to make available adequate appropriations to carry out a continuing program became clear, the development of plans has been rapid. Today all but 4 states and Puerto Rico have approved plans and are actively participating in the program. Two of these 4 states have already submitted tentative plans (Texas and Colorado), and it is expected that the remaining 2 (North Dakota and Louisiana) will send in plans soon. Further consideration is being given to coöperation by Puerto Rico. In the 6 months since Congress made the first appropriation the 47 states now coöperating reported that care has been authorized for nearly 70,000 wives and infants of enlisted men. Estimates on the basis of which the most recent appropriation of $18,600,000 was made indicate that during the present fiscal year in the neighborhood of 300,000 wives of enlisted men may be expected to apply for maternity care. How many will apply for medical care for their infants cannot even be estimated at present.

Statistics are not yet available to show the composition of the group now applying for maternity care or their characteristics as to age, parity, race, or place of residence. Nor do we yet know about the attendants at birth, the place of birth, the mortality among mothers and infants. Plans for gathering information on these matters are, however, under way.

The responsibilities of administrative agencies in carrying out this mandate of Congress are obviously great because the medical care of many hundred thousand mothers and infants will be involved and basic principles of administrative procedure will be laid down, while at the same time due regard must be given to the efficient and proper use of large sums of taxpayers' money.

In discharging her duty in the allotment of funds to state health agencies as set forth in the act, the Secretary of Labor has issued a regulation instructing the Children's Bureau to administer the program in accordance with certain provisions of Title V, part 1, section 503(a) and (b) of the Social Security Act. These provisions relate to methods of administration, coöperation with medical, nursing, and welfare groups and organizations, reports by state agencies, and approval of state plans by the Chief of the Children's Bureau. Under this authority the Chief of the Children's Bureau has the responsibility to establish administrative and professional standards (apart from those related to practitioners performing obstetrical services) by which may be measured the adequacy and efficiency of state plans and to give information to the state agencies as to these standards so that their plans may be in reasonable conformity.

In developing the general policies established for this purpose the Children's Bureau has had the advice of the Conference of State and Territorial

Health Officers and the Maternal and Child Health Committee of the Association of State and Territorial Health Officers, and has consulted with its special obstetrical and pediatric advisory committees, and with groups of hospital administrators. The bureau will continue to seek advice from these sources. The final responsibility for establishing policies and standards rests, however, with the bureau, and when advisers differ decisions must be taken that may not always meet the recommendations of all groups. It is also the responsibility of the Children's Bureau to interpret, with the aid of its legal counsel, the intent of Congress, and to administer the program accordingly.

As state plans have been formulated and programs started, certain general administrative principles have emerged and policies have been established that I would like to discuss here. From the beginning it was clear that certain general policies had to be nation-wide or too great confusion would have resulted.

The language of the appropriation acts and the legislative history surrounding their passage have made clear the intent of Congress in passing this legislation. The most recent legislative history connected with the appropriation of $18,620,000 for this program leaves no doubt that the Congress intended that all necessary care would be made available and that physicians, nurses, and hospitals would be paid for services. The Congress was unwilling to initiate any other plan, such as cash grants to the wife, since such a plan, it believed, would not assure the medical and hospital care and might well defeat the primary purposes of the program.

The Congress has also made it clear that this is not a so-called "charity" service, but that it is to be provided as the right of any wife of an enlisted man in the fourth, fifth, sixth, or seventh grades of the Army, Navy, Marines, or Coast Guard who applies for care for herself or for her infant during his first year of life. No "means test" or financial investigation is involved. To permit any test or investigation that might result in uncertainty as to whether or not care would be paid for would at once nullify the primary purpose of the program and shake the confidence of the enlisted men in the safety of their wives and infants.

Another basic principle under which this program is being administered is that wives of enlisted men applying for care should have free choice in the selection of their care, provided the choice is made from among physicians, clinics, hospitals, or health agencies approved by the state health agency under conditions laid down in its state plan.

That an individual wife should be free under the program to select, if she wishes it, care by a private physician in his office, and that there should be no limitations on her choice other than those needed to assure reasonably high quality of care and economical and effective use of public funds, is reasonable and right. However, it is also reasonable and right that she should be equally free to select care in a clinic, a health center, or a hospital, either public or voluntary. She should be entitled under this program to make an arrangement for complete maternity care in the outpatient and inpatient service of an approved hospital that provides this unit of service for a fixed fee covering both medical service and hospital care.

The legislative history has made it clear that this is not a program limited to care given by private practitioners, but that all existing community facilities, including prenatal clinics, child health conferences, public health nursing services, outpatient clinics, medical social services, should be used to provide, as far as possible, complete care for mother and infant. Each of these

wives should be free to apply for and receive the services of a public health nurse without question whenever such services are available.

In approving state plans, the Children's Bureau has specified that policies may not be adopted by state health agencies that would prevent this free choice of the type of care desired by the wives of the enlisted men.

Still another general principle that obviously must be laid down for the administration of this program is that the quality of care must be kept high. A review of the discussions in Congress and in committee brings out the fact that from the beginning it has been the intent of Congress to provide as complete and as satisfactory maternity and infant care as is feasible for the enlisted men's wives and infants. Therefore, to supplement the care usually recognized as necessary for the uncomplicated maternity case or for routine medical care and health supervision of the infant, special additional care needed for complications or serious illness has been made possible under the program. This includes consultation and diagnostic assistance of specialists, prolonged hospital care, special nursing service, special diagnostic procedures as x-ray examinations, special therapeutic procedures as blood transfusions or appliances. Provision for payment for each of these special services is made in all state plans. Obviously, the quality of care will depend on the standards established by state health agencies for the selection of physicians, hospitals, and clinics offering care, and on the ancillary public health nursing and welfare services made available.

In passing the Labor Federal Security Appropriation Act for 1944, the Congress placed the responsibility for setting standards for practitioners performing obstetrical services squarely upon the state, and withdrew from the Children's Bureau its former right to establish these standards. State health agencies can no longer rely upon the federal agency in this respect, but must look to their own statutory authority to maintain high standards of obstetric care. For all other standards of professional service the Children's Bureau still has the power to set up the measuring sticks it will use in approving state plans. I would caution the state health agencies to look sharply at the standards of obstetric care they are setting and take all necessary steps to keep them at a high level so that we may maintain the excellent record in the reduction of maternal mortality of the past decade.

The last and perhaps the most obviously controversial principle that I want to discuss here is that payment for care under this program by the state health agencies whether to physician, hospital, clinic, or nurse must necessarily be at fixed rates based on average costs of adequate care excluding luxury services.

Experience has shown that in the case of hospitals and clinics, such rates may be reached comparatively easily on the basis of the so-called "ward-cost-per-patient-day." Such a basis of computation of cost of hospital care was established and is now in use under the Crippled Children's Program; it covers the cost of interne and other paid physicians' services as well as all other costs of routine care. This does not mean, however, that accommodations would necessarily be in wards though wards may be used, but that the rate paid would be based on ward costs. Actually the rate paid in most hospitals exceeds the rate scheduled by the hospital as the charge to ward patients; it may even reach or nearly reach the semi-private rate. The hospital may place the wives of servicemen in any accommodations they wish to make available, but the hospital cannot expect a higher rate of pay

than the ward-cot-per-patient-day.

In developing rates for payments to private physicians, on the other hand, the task is not so easy. Maternity care is a unit of service that lends itself very satisfactorily to a fixed fee plan. In arriving at a fixed fee, therefore, it becomes necessary to establish rates which represent a fair average of the usual range under the sliding scale, excluding the maximum charges made to patients in the highest income brackets and bearing in mind all the while that there will be no unpaid bills if required reports are submitted. Because of the wide variation in maximum fees charged by private practitioners in different parts of the country, it has become necessary for the federal agency to set a maximum.

A corollary of this principle of fixed rates for medical and hospital care to be paid by state health agencies under this program is that additional fees will not be charged by private physicians, and hospitals will not charge the recipients of care extra when accommodations other than ward care are made available. To permit such additional charges would force the wives of the enlisted men into negotiating with physicians or hospitals in respect to the fees or rates they would be willing to pay over and above the amount paid by the state health agency. If such negotiation with physician or hospital were permitted it would be, in effect, a means test applied by the physician or hospital which would defeat the primary purpose of the program, namely, the provision of care without cost to the wife of the enlisted man. It would at once introduce an element of uncertainty as to whether the care is assured.

The question has been repeatedly raised as to whether it would not be acceptable for a state health agency to pay the cost of hospital care and allow the wife of the enlisted man to negotiate the medical fee privately with her physician. If a wife of an enlisted man is financially able to pay higher fees charged by some obstetricians and chooses to do so, it has to be assumed that she can and should also pay for hospital care. Any other arrangement would mean that pressure could be brought to bear on any enlisted man's wife to pay physician's fees that are in excess of those paid by the state health agency and to apply to the state health agency for hospital care only.

To make it possible, however, that wives of enlisted men who wish to do so may make payments toward the total cost of their care provided under the state plan, state health agencies may arrange to receive voluntary contributions toward the total cost of their care from the recipients of care or from others in their behalf. The money so paid would be added to the funds for the program in the state treasury, and would not be used to raise the physician's fee or the payments to hospitals.

I have discussed at some length these basic policies underlying the administration of this maternity and infant care program because many individuals have not understood the reasoning back of these decisions. The rapid development of the program has brought many difficulties, especially those involving the location of personnel to handle the detail of office administration. I am glad to be able to report that order is taking the place of confusion; procedures have been clarified; and policies are better understood.

The speed with which small divisions of maternal and child health have grappled with the job and the efficient methods that are now being established are a great credit to the directors and their staffs and to the others in the health departments that have given the maternal and child health divisions a hand. It has not been generally appreciated, and this applies also to the

Congress, that most of the Social Security Title V funds are spent by the states for local service and that only relatively small central state administrative staffs were available to take over the large task of the emergency maternity and infant care program. It is a great credit to the states that it has been put into operation as promptly as it has.

Of course, many difficulties are yet to be overcome, but I am sure the way will be found, if together we continue to discuss the pros and cons and keep in mind the welfare of the people we are trying to serve as the test of the reasonableness of our decisions. Is it unreasonable to ask that we strive to give as good care to the wives and children of men in the armed forces as the Army and Navy are giving to the men themselves, and that we give it as freely and certainly? With such a goal in mind most difficulties can be smoothed away. No program of this size and importance could be developed without many growing pains and without some mistakes being made. The experience to be gained is very great and will stand us all in good stead as the maternal and child health programs expand in the years to come.

Epidemiological Notes on Meningococcal Meningitis in the Army*

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THE Army's health record has been remarkably good during the present war. In only a few respects has it been less favorable than that of the small peacetime army quartered in permanent installations and made up largely of seasoned troops. Meningitis is the chief disease which has increased in prevalence, and for this reason it is believed that a review of our experiences to date with meningococcus infections should be worth while.

It is emphasized that this paper is not intended as a complete epidemiological study, but merely as a presentation of some of the outstanding points about the incidence of the disease during the past winter and spring in Army camps and stations in this country. No reference is made to carrier rates, types of meningococci found, or other bacteriological features because these are fully discussed in other papers presented at this meeting.

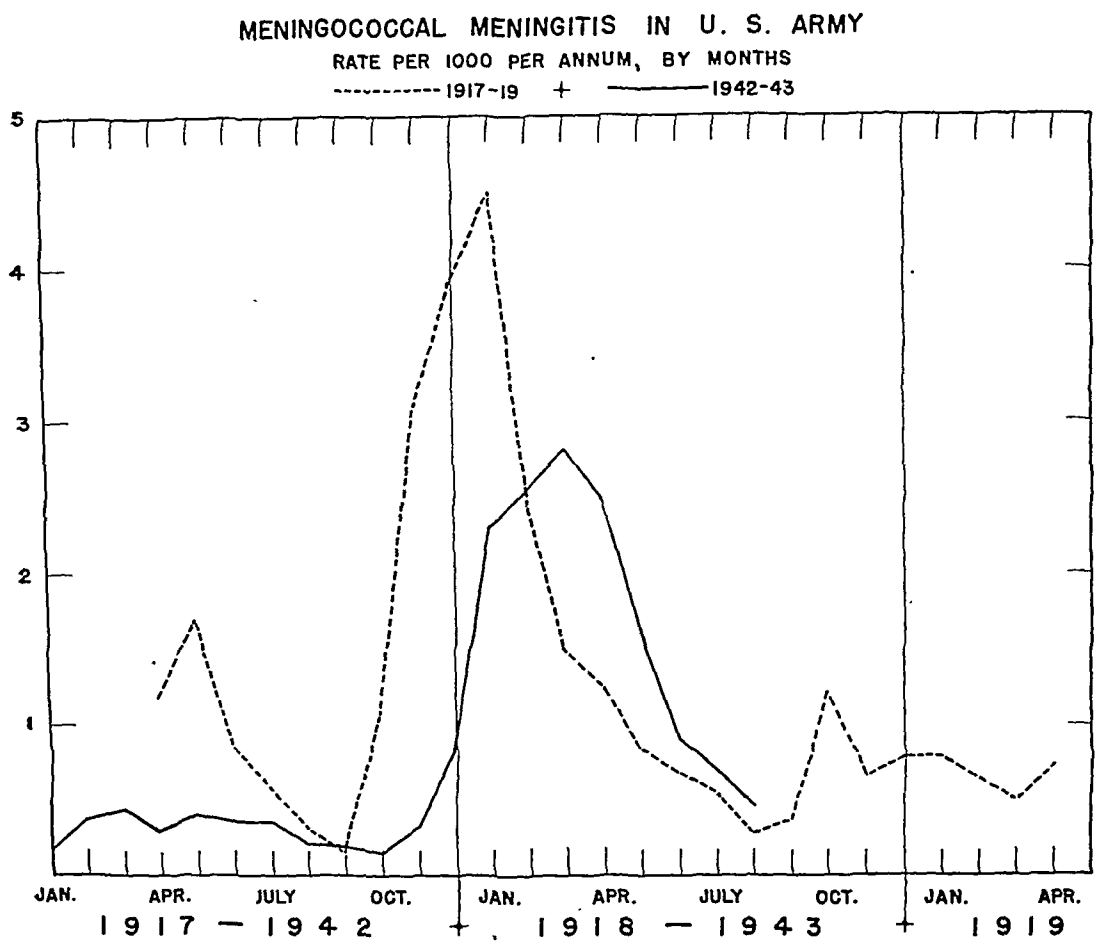
Some comment should be made as to the reliability of the data on Army incidence. This is undoubtedly more complete than civilian reporting, but cannot be regarded as entirely accurate. Individual judgment and difference in diagnostic criteria give rise to differences in reporting. The reporting of meningitis cases in which the etiological agent had not been bacteriologically identified varied at different posts; such cases were often classified as "meningitis, other types," and were not always included in incidence rates. There were also numerous cases of septicemia, presumably meningococcal, where positive cultures were never obtained and no report was made. Furthermore, the data used were weekly morbidity reports which are provisional and subject to later correction.

It is known that meningitis occurs in cycles lasting several years with a sharp seasonal rise and fall superimposed on the long cyclic wave. The years of highest prevalence in this country since the first World War were 1929 and 1936. The incidence is also high during wars and among military forces. The present war has coincided with an expected cyclic increase and it is likely that the resultant of these combined factors has been a much higher prevalence than would have been produced by either one acting independently.

The last major epidemic of meningitis in the United States Army was in the winter following our entry into the first World War. It was an explosive outbreak reaching its peak in January, 1918, and subsiding by the following August nearly to the previous level. A secondary peak followed in September,

* Presented before the Laboratory Section of the American Public Health Association at the Seventy-second Annual Meeting in New York, N. Y., October 12, 1943.

FIGURE 1



but the rate was less than one-third of that attained in January [1] (see Table 1 and Figure 1).

By comparison the curve of the recent epidemic is strikingly similar. It, too, began within a year after our entry into the war, although somewhat longer after the beginning of mobilization. The peak incidence was two-thirds of that in 1918 and occurred in the month of March; but the increased rate has lasted longer so that the annual rate, when computed at the end of the year 1943, may well be nearly as high as that for 1918.

Coincidentally with the outbreak of meningitis in the Army, there occurred a greatly increased prevalence in the civilian population (see Table 2). Both increases, the military and the civilian, were, roughly, tenfold above the normal prevalence. In keeping with the well known predilection of meningitis for military forces, its incidence in the Army both in peacetime and during the

TABLE 1

Meningococcal Meningitis in Army in United States

Admission Rate per 1,000 per Annum, by Months

	1917	*1918*	*1919*	*1942*	*1943*
January		4.48	0.80	0.17	2.32
February		2.43	0.66	0.38	2.58
March		1.51	0.50	0.43	2.82
April	1.18	1.25	0.74	0.29	2.48
May	1.71	0.83	0.70	0.40	1.63
June	0.85	0.68	0.44	0.37	0.91
July	0.58	0.55	0.39	0.36	0.70
August	0.32	0.28	0.38	0.21	0.46
September	0.15	0.37	0.17	0.19	
October	1.08	1.21	0.09	0.15	
November	3.09	0.67	0.09	0.32	
December	3.94	0.80	0.09	0.87	

epidemic, was considerably higher than in the civilian population, the ratio between military and civilian rates remaining quite constant.

TABLE 2

Meningococcal Meningitis in United States Civilian Population

Rate per 100,000 per Annum, by Months

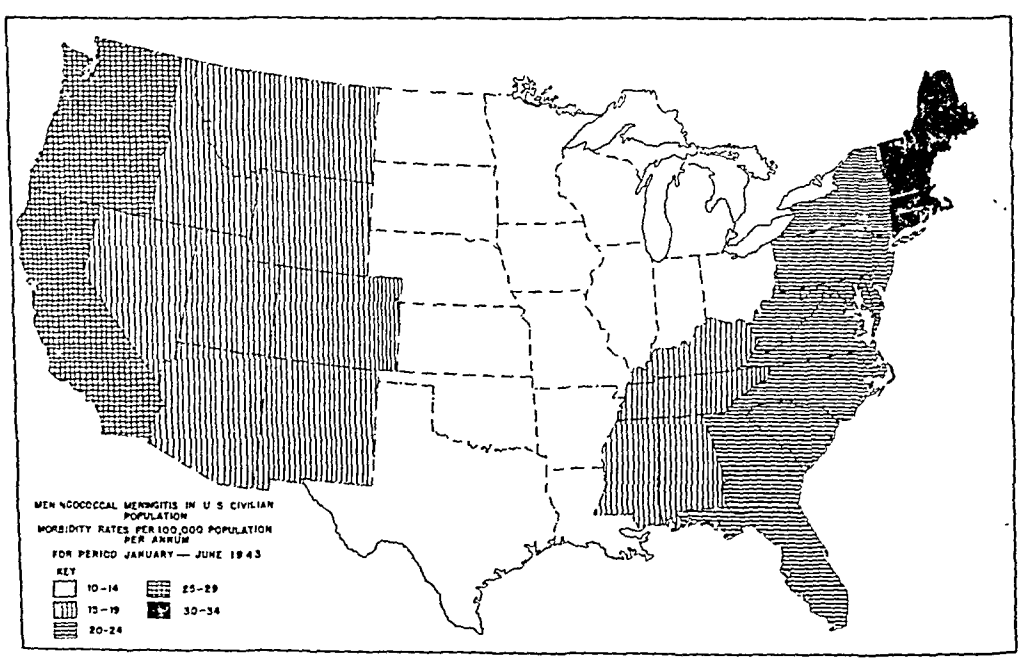
	1942	*1943*
January	2.2	11.6
February	2.7	16.6
March	3.3	22.4
April	4.0	23.5
May	3.3	20.3
June	3.1	14.9
July	2.2	9.6
August	2 1	7.0
September	1.7	...
October	2.3	...
November	2.8	...
December	3 8	..
Total	2 8	

During the epidemic there was a distinctly higher prevalence of meningitis in the civilian population along the Atlantic and Pacific seaboards than in the interior of the country. Arranging the geographic regions in the order of ascending meningitis incidence for the first half of 1943, we have the following sequence: The West North Central States were lowest, followed by the West South Central, East South Central, Mountain, Middle Atlantic, South Atlantic, Pacific, and New England states, which had the highest incidence. The map, Figure 2, illustrates this point.

In the Army, on the other hand, no distinct geographic localization was observed. The epidemic began at approximately the same time in all portions of the country although there was a variation of several months between its onset in individual stations. Figure 3 is a map of the United States, divided by service commands, on which the incidence of meningitis in the Army over the same 4 month period is shown for comparison with Figure 2.

Table 3 shows the course of the outbreak in terms of annual rates by weeks from October, 1942, through August, 1943. This is a composite picture made up of much briefer individual

FIGURE 2



outbreaks at separate posts. The peak was reached in the week ending March 27. It will be noted that while the descending portion of the curve is quite similar to the ascending portion, the incidence in August, 1943, was still roughly three times as high as in the previous fall. On the basis of past experience with civilian outbreaks, it is anticipated that the incidence will continue to be above the normal inter-epidemic level during the coming year. There are, however, reasons to believe that it will not be as high as during the past winter. These are the smaller proportion of new recruits who will be in training and the likelihood that spacing of troops will be more ample than was possible last winter.

Through the courtesy of Dr. John J. Phair, Director of the Army's Meningitis Commission, a preliminary tabulation has been made of the frequency of meningitis in relation to duration of military service. This is based on a total of 1,337 cases that occurred in the early part of the epidemic in all parts of the country. This relationship is shown in Table 4, and graphically in Figure 4. Of the total cases, 57 per

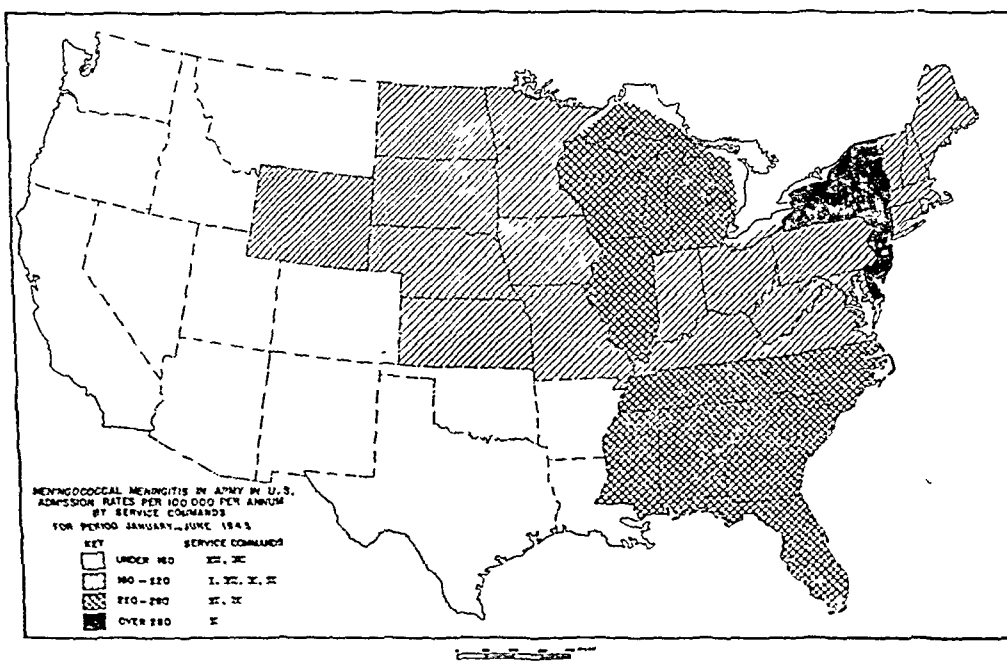
TABLE 3

Meningococcal Meningitis in Army in United States

Admission Rate per 1,000 per Annum, by Weeks

Week Ending		*Week Ending*	
Oct. 3, 1942	0.16	March 6, 1943	2.69
10	0.11	13	2.70
17	0.17	20	2.80
24	0.13	27	3.10
31	0.21	April 3	2.97
		10	2.55
Nov. 7	0.21	17	2.60
14	0.22	24	1.82
21	0.32	May 1	2.03
28	0.53	8	1.85
		15	1.45
Dec. 5	0.49	22	1.55
12	0.77	29	1.27
19	1.09	June 5	1.15
26	1.14	12	0.99
		19	0.75
Jan. 2, 1943	1.53	26	0.74
9	2.02	July 3	0.95
16	2.08	10	0.77
23	1.73	17	0.63
30	2.08	24	0.56
		31	0.53
Feb. 6	2.51	Aug. 7	0.42
13	2.25	14	0.65
20	2.79	21	0.41
27	2.77	28	0.38

FIGURE 3



cent occurred in the first 3 months after induction and 29 per cent occurred in the period between 30 and 60 days after induction. Only rarely did men who had been in the Army more than a year develop meningitis. While it is true that these figures must be interpreted with some caution because they do not take into consideration the population at risk in each group, nevertheless they do portray the decided affinity for new recruits. The number of men inducted each month during the year preceding collection of these figures was fairly constant, so it may be assumed that the population by length of service in months up to 1 year was reasonably uniform.

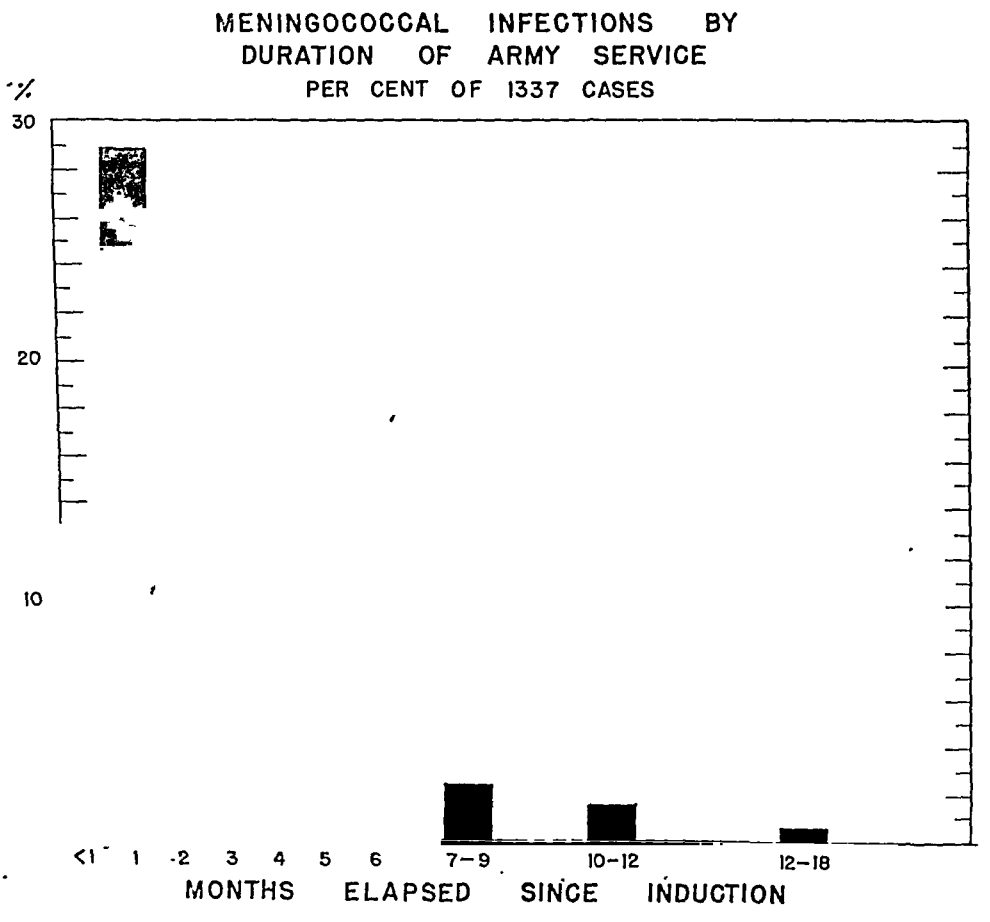
TABLE 4

Meningococcal Infections by Duration of Army Service in Months

Months Elapsed Between Induction and Onset of Disease	*Cases*	*Per cent of Total Cases in Each Month (Average)*
Less than 1 month	175	13.1
1	387	28.9
2	206	15.4
3	119	8.9
4	86	6.4
5	72	5.4
6	51	3.8
7 to 9	88	2.2
10 to 12	65	1.6
12 to 18	39	0.5
18 to 24	24	0.2
24 to 36	12	0.1
Over 36	13	...
Total	1,337	

Meningitis rates tended to be definitely higher in the larger stations.

FIGURE 4



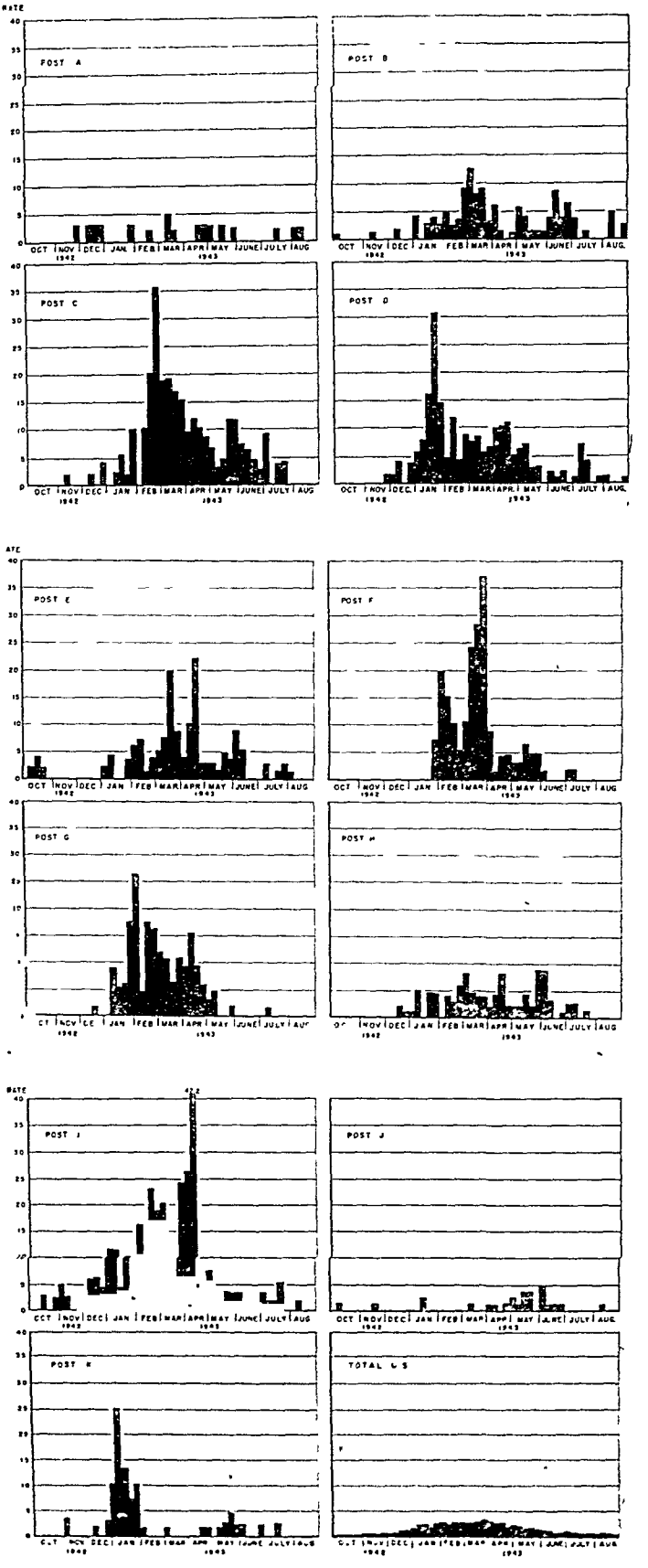


FIGURE 5

MENINGOCOCCAL MENINGITIS

Admission Rates per 1,000 per Annum by Weeks at Army Posts

During the 4 month period, January through April, 1943, the incidence in terms of cases per 1,000 strength per annum was as follows: For all stations with a strength above 20,000 it was 3.2; for those in the range from 10 to 20,000 it was 2.8; and for those of less than 10,000 it was 1.0. This marked difference is believed to be related to the greater proportion of new recruits and more rapid turnover at large stations.

There has frequently been speculation as to the possible association of meningitis and respiratory disease. Both diseases tend to reach their seasonal peaks in late winter or early spring. It has been suggested that increases in upper respiratory disease tend to facilitate the transmission of meningococci from person to person. The association between meningitis rates and the rates for common respiratory diseases (including influenza) was studied in stations above 20,000 strength during the 4 month period from January through April. Ports of embarkation, general hospitals, maneuver areas, and urban centers consolidating several units were omitted from this study. A fourfold association table was constructed dividing the stations into those having rates above and below the mean for meningitis and for common respiratory disease. A statistically significant positive association between the two variables was found. It was noted that in several stations secondary increases in meningitis followed secondary rises in the incidence of common respiratory diseases. The meningitis peak tended to follow the respiratory peak after a variable period, often 4 to 6 weeks.

Weekly incidence rates at certain posts are presented in Figure 5. These posts were chosen as showing interesting features. They each had a strength of 20,000 or over. Posts A and B are of interest because they are situated less than one hundred miles apart. Post A had a decidedly low rate, without anything that could be called an epidemic during the entire 11 month period of study, from October, 1942, to August, 1943. Its maximum rate in any week was 5 per 1,000 per annum, and its average rate for the period from January to April was 0.8. This post is a recruit reception center where men remain usually less than a week after induction and are then shipped to other stations for training. It is a permanent installation with excellent housing facilities in either brick or well constructed frame barracks. Double decking of bunks is rarely necessary during the winter. The weather at this post was unusually severe. There was a moderate but sustained incidence of respiratory disease lasting from January to April.

Post B nearby is about twice the size of A. It is a replacement training center. Due to military necessity the housing of troops was crowded, with 90 to 100 men in barracks built for 63 men. This situation existed until May but has since been corrected. Common respiratory diseases at this camp reached a fairly high peak in January but declined the next month. A lower secondary peak occurred in April. Meningitis reached a peak in early March, with a less marked secondary increase in June. The pronounced lowering of the incidence in April is probably related to the administration of sulfonamides to a part of the force.

Post C is an Army Air Force basic training center on the middle Atlantic coast. New recruits arrive direct from reception centers and remain for 4 weeks of intensive training. The monthly turnover of troops during the winter was more than 10,000; in fact, during January 27,000 men were received. These troops were quartered in hotels, and it was temporarily impossible to provide the minimum amount of floor space in sleeping quarters which

is generally considered desirable in stations housing new recruits. In June the strength of the force was much reduced and a minimum of 50 square feet provided. Respiratory disease incidence was quite high for a period of 4 months. Meningitis reached a sharp peak in late February and gradually declined with a secondary peak in late May.

Post D is a very large permanent station in the Southeast. Its housing facilities consist of hutments and wooden barracks and are considered good, but some overcrowding was present at times. Two infantry divisions were in training here during the winter. Respiratory disease reached a rather high peak in January followed in 2 weeks by a sharp elevation of meningitis rates. The incidence of meningitis then dropped to a moderate level which persisted until May. Prophylactic sulfadiazine was given to a small part of the force in April.

Post E is another air force station in the South where the strength increased greatly during the winter, necessitating crowding of troops. During the 3rd week in March there was a sharp meningitis peak, with another 4 weeks later. The common respiratory diseases reached a peak incidence during January, February, and March, and declined sharply during April.

Post F is a newly built camp which was still under construction at the beginning of the season. In January and February an infantry division was activated, increasing the strength very rapidly from a few thousand to many thousand men. There was no serious overcrowding, however. This division was made up chiefly of young men direct from civilian life. Practically from their arrival there was an extremely high prevalence of respiratory disease which fell to normal levels in April. Meningitis rose abruptly and attained a rate of 37 in the last week of March, after which it dropped even more abruptly to rates of less than 5. Sulfadiazine was administered to half the division at the height of the epidemic, undoubtedly influencing the subsequent picture.

Post G had an experience quite similar to several already described. Practically no cases occurred outside the period from January to May. This is a southern infantry replacement training center which receives men from recruit reception centers and gives them several months of basic training.

Post H is a southern station in the same state as posts E and F. Two infantry divisions were trained here and field maneuvers were held during the winter. The point to note here is the fairly constant level of incidence of meningitis from January to June, without any marked fluctuation.

Post I is located in a middle western state. It is a large Army air force basic training center. Upper respiratory disease, atypical pneumonia, and meningitis have been more or less constant problems at this post for some time. Meningitis increased steadily to a peak of 42.2 per 1,000 per annum in early April; this is the highest rate attained by any of these eleven stations. It then dropped abruptly to an endemic level of 2 to 3 per 1,000. The respiratory rate was moderately high from December through March, with a peak in February. Several of the same factors have been operative here as at post C; namely, overcrowding and the reception of large numbers of new troops who remain long enough for susceptibles to come down with these diseases and then are replaced by new groups.

Post J is in a midwestern state and its troops are garrisoned principally in permanent buildings. The buildings are scattered over a wide area and there has been no overcrowding. It is a field artillery school and its personnel on the

average consist of distinctly more seasoned troops than make up most of the other stations discussed. It had the lowest incidence by far of both meningitis and respiratory diseases of the eleven stations, the highest meningitis rate being 4.7 and the average for the period January through April being 0.4.

Post K is in the Pacific Northwest. Two infantry divisions were located here, one of them activated in December. Overcrowding was a definite feature of this camp during the winter. In December, immediately after activation of the division, there occurred an explosive but short-lived respiratory outbreak which produced an incidence nearly twice as high as at any of the other eleven stations. Meningitis appeared in January, reaching its peak in the middle of the month, and then dropped off moderately. At the end of the month sulfadiazine was given to almost the entire force and meningitis practically disappeared. This was the first large-scale use of the drug for such a purpose. Only sporadic cases have since occurred.

The last graph depicts the rate by weeks for the entire Army in this country. It is clear from this that most of the stations discussed had rates far above those for the country.

Among the comments made by medical inspectors at posts where meningitis occurred, none was more frequent than the statement that there was generally no direct relationship between cases. Seldom could a contact even of a casual nature be shown with a previous case when a new case developed. The control measures employed varied to some degree but included daily medical inspections of contacts for at least 7 days. In some posts partial segregation (working quarantine) of contacts was practised but this is not considered an effective measure. Suspects and cases were promptly hospitalized. Measures were adopted to reduce overcrowding both in barracks and at gathering places. Other measures specifically aimed at safeguarding sleeping troops against transmission of respiratory organisms were employed; such as head to foot sleeping, "cubiclization" by means of shelter halves, and the insurance of proper ventilation.

Sulfonamides were administered to large numbers of troops in several of these stations with apparently striking effects in reducing the incidence. This is unquestionably a most important development in meningitis control, but its consideration is beyond the scope of this paper. A circular letter has now been issued by the Surgeon General outlining the indications for this procedure.

We have no evidence that the cases encountered in this epidemic were any less severe than in other outbreaks. However, sulfonamide therapy has been extraordinarily effective and the case fatality rate has been below 5 per cent or, roughly, one-tenth as high as during the 1918 epidemic. In a large number of cases the diagnosis was meningococcemia and invasion of the central nervous system did not occur, due presumably to the prompt administration of sulfonamides.

SUMMARY

1. Review of the Army incidence of meningococcal meningitis during the past year is presented.

2. The incidence has been somewhat lower than in 1918, but the outbreak has been comparable in various ways to that in the first World War.

3. The incidence in the civilian population increased in the same proportion as in the Army.

4. The geographical distribution in the Army was fairly uniform in all regions of the country in contradistinction to the concentration of civilian cases in the eastern and western seaboard states.

5. Data are presented which indicate that a majority of all cases occurred in recruits who had been in the Army less than 3 months, and that the highest incidence was between

30 and 60 days after entry into the service.

6. The definite relationship between size of post and meningitis incidence is shown.

7. The possible relationship between respiratory disease prevalence and meningitis incidence is explored and evidence of association obtained.

8. Rates of incidence by weeks in various posts are presented. Factors influencing the rate are discussed. The principal factor appears to be the presence of a high proportion of unseasoned troops, especially when there is a rapid turnover of such troops.

9. Control measures are discussed. The outlook both for treatment and prevention of meningococcal infections has been radically improved by the sulfonamides.

REFERENCE

1. Simmons, J. S., and Michie, H. C. *The Medical Department of the United States Army in the World War.* U. S. Gov. Ptg. Off, 1928, Vol. 9, Chap. IV, p. 203.

Progress in Establishment of Standards on Allowable Concentrations of Toxic Dusts and Gases

At a recent meeting of the committee of the American Standards Association concerned with approval of Allowable Concentrations of Toxic Dusts and Gases, it was reported that 6 standards had been approved during the present calendar year, and that altogether 12 standards had been promulgated under the auspices of the committee since its reorganization two years ago. Senior Sanitary Engineer J. J. Bloomfield of the National Institute of Health represented the American Public Health Association.

The standards now being considered are on methanol, styrene monomer, formaldehyde, trichloroethylene, and acrylonitrile. A standard on toluene has been approved and published. The proposed standards for oxides of nitrogen approved by the committee are now being processed through the Safety Code Correlating Committee.

Considerable discussion was given to the preparation of a standard for silica dust exposure. It was finally decided to prepare a standard which would take into consideration the data now available for threshold limits for various industrial dusts with a silica content. The consensus of opinion was that no single maximum allowable concentration could be developed in view of the fact that no two dusts containing silica have the same effect on health, even when the silica content may be the same.

The chairman was authorized to appoint subcommittees to consider the following standards: methyl chloride, which is now being used in place of Freon as a refrigerant; hydrofluoric acid, fluorine and fluorides; and a standard for exposures in luminous painting to take care of radon, gamma rays, and radium dust.

Objectives in the Programming of Post-war Sanitation Works*

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WE are now engaged in a great war that is testing our capacity to produce, to arm, and to conquer. Because of the success of their planning, we may never know how much we owe to military staff groups who through the years of peace have prepared the blueprints of war. But when military objectives are won, plans will be needed to guide us upon our return to a peacetime economy. We can lose the peace on the home front through a lack of preparedness.

Our battles are being won because military men with a vision stayed with their planning despite the popular belief that war would be no more. It was not easy for them to go counter to the wishful thinking of a nation that wanted peace—and it will not be easy now to gain popular support for the staff work that must be done in the preparation for peace. Unlike the plans for war, the plans for peace must be of, for, and by the people, and acceptable to the majority. It is proper that we should be concerned with the problems of the post-war period and attempt to analyze the conditions that may give rise to emergency situations, and to find in advance solutions for them.

There are those who have questioned the ability of a democracy to meet emergency problems without resorting to the direct action procedure of the dictator. The fallacy of their reasoning lies in their failure to recognize our freedom to anticipate emergencies—and by planning their solution in advance to remove the emergency character of their occurrences. We are not regimented when we plan together for our mutual good.

One of the fundamental principles that give strength to our democracy is the recognition it gives to the freedom of the individual citizen to join with his fellows in the formulation of such governmental policies as may be acceptable to the majority of the group.

The problems of post-war reorganization will retain their emergency character only to the extent that we fail now to anticipate them. This nation can ill afford the social and economic loss that must come if we leave to emergency salvage measures plans for the proper utilization of the most valuable of all our nation's resources—its man power.

Past experience has indicated the value of a public works construction program as a means of providing employment during a period of economic depression. It is therefore logical that our plans for the future should have incorporated in them proposals for the use of this method of employment stabilization. It is easy to classify long lists of needed public works and to envision the material changes that can be brought about by their construction.

* Presented before the Engineering Section of the American Public Health Association at the Seventy-second Annual Meeting in New York, N. Y., October 14, 1943.

It is not so easy to appreciate that material change alone will not make this nation strong or its people happy. There is a need in the planning of our post-war procedures to go deeper than the mere providing of bread alone. We need to recognize that, unless in our planning we keep alive the essentials of true democracy, in spirit our nation can starve in the midst of material plenty. Certain basic principles are essential to the continued vigor of our democracy, and in our planning for the post-war period it is important that we recognize these principles and thus establish better the very foundation of our government.

There are many would-be Aladdins who long for a magic lamp to conjure up the objects of their wishful thinking and who envision a post-war world, limited by their conception of what that world should be. Unconfessed dictators at heart, they would impose their particular pattern of perfection by fiat act. Material progress can, and in emergency sometimes must, be made in this way, but the principle is foreign to the spirit of the cause for which we fight.

Any progress that is made without full recognition of the essential need for an informed and responsible electorate will be based on the shifting sands of political expediency without adding to the stability of a free government of the people. Freedom of action is equally essential to the spiritual growth of an individual and to the civic development of a town or city. This freedom is also essential to the vitality of our democracy. Mistakes must be eliminated, not by removing the freedom of individual or group action but rather by the slower process of educating the majority. Real governmental leadership will have been achieved when, through the advantage of careful, economic, social, and engineering analysis, factual information will make it possible for an informed electorate to assume its proper civic responsibility.

Because of national emergencies, first economic and then military, it has been necessary to expedite construction programs through administrative procedures that have emphasized the speedy attainment of essential national objectives. The immediate success of these procedures in meeting emergency situations makes an appeal to those who are thus relieved of local responsibility.

Should emergency measures that do not require a mature civic response on the part of the majority become permanent, it is inevitable that there will be a loss of civic interest that can lead to an eventual loss of civic liberty. As citizens of a democracy, we must respond to the trust that this form of government places with us and face civic responsibility free of the immaturity of wishful thinking—or we will not be worthy of or long retain the freedom that we now enjoy.

The development of a program of post-war public works will have missed an essential objective if there is a failure between the planning and construction stages to develop a local interest in and civic responsibility for the proposed improvements.

The encouragement of local civic interest in public affairs, including public works, is so essential that the development of governmental procedures which will not only promote but will require this interest may well be a basic objective in programming post-war sanitation works. This will require an integration of the functions of local, state, and federal governments in the planning and development of public works in order to accomplish the program without a usurpation of responsibilities that should remain with local government, on one hand, and an uncoördinated effort that would fail to provide a maximum national benefit, on the other.

A second major objective in the programming of post-war sanitation works may well be the development of procedures that will encourage the planning of projects sufficiently ahead of the construction period and in such detail as to permit a thorough understanding of the objectives to be attained. The development of a proper civic interest in proposed public works requires that there be a time interval between the design and the construction stage of a project to permit an educational presentation to the public of the need for the project.

There should be a more general public appreciation and acceptance of the value of basic engineering data in the design of public works and of the time required for the development of the proper design. Back of every properly designed engineering project there must be a well defined objective—it is the vision of that objective that gives incentive to the engineer to translate it into reality. The need for public works is evident to the engineer responsible for the maintenance of a service facility long before there is a public consciousness of this need. The public tacitly pays homage to the engineering planning back of the completed structure by the ready acceptance of its usefulness. Unfortunately, the same public frequently forgets that the design must be based on a careful engineering analysis of factual data if the completed structure is to be the most effective and economical solution of a public need.

As we study tomorrow's problems, we recall the unemployment emergency of a few years back—and the popular demand for the immediate starting of public construction work. We should not forget that this emergency need for employment found us unprepared for the effective utilization of the man power then available—and how the public works official was expected to do the impossible—to provide worth while construction projects without the guidance of adequate planning.

Credit is due to those who faced that emergency and through whose efforts much was accomplished. That was an emergency period and our failure to be ready to undertake the responsibilities that came with it was understandable if not excusable. To have failed to learn by that experience is neither.

We are prone to envision programs of post-war public works against the background of a program that was designed to meet an emergency situation. If our future public works programs are to be most effective in stabilizing a national reëmployment situation, certain controls may be necessary to insure the scheduling of construction work at such levels of activity as may be necessary to avoid either a wasteful surplus or a shortage of the necessary supplies and labor.

The post-war public works program will have failed in a proper objective if it functions only after an anticipated situation has been allowed to become an emergency.

We can face the complexity of these post-war problems and attempt to reach rational solutions—or we may become lost in the confusion of conflicting interests and forget that the freedom we enjoy can be had only through the acceptance by the majority of necessary rules of orderly procedure.

We may wait until dole-like contributions of federal funds are necessary to stimulate a sick domestic economy—or we may in government, as in public health, recognize that prevention is better than a cure, and provide the funds necessary for advance planning.

A post-war public works program will be of value in the stabilization of employment to the extent that there is at all times an adequate reserve of planned projects ready for construction, and a

public willingness to schedule their construction to meet this need.

A reserve of planned public works projects will require more than the mere tabulation of recognized public needs. Advance planning will require the completion of detailed engineering studies and the preparation of engineering reports. It will require that there be an acceptance of the project by the sponsoring community and the completion of necessary legal and financial clearances for construction. The orderly development of a reserve of planned public works may well require that there be a coördination of governmental interest, local, state, and federal, in the planning of projects for deferred construction. The maintenance of an adequate reserve of planned public works to attain a national objective of effective employment stabilization may require that there be an acceptance of some control of possible over-expansion of construction activity.

Through a properly integrated program of public works, this nation can achieve a standard of national well-being beyond our present expectations. There is little need to catalogue the improvements that can be made in the field of sanitation—they are known to most of us.

If we truly believe in a democracy and are willing to work at keeping its principles alive, we can have this material progress and at the same time save the spirit that has made this nation great. If in the planning for the future we neglect democratic procedures, our public works may well become but a monument to a decadent civilization.

The Battle for Health*

A Radio Script

IRVE TUNICK

Radio Adviser to the New York Local Committee for the Association's 72nd Annual Meeting

(Music.....Organ fanfare...)

Announcer: The Columbia Broadcasting System, in coöperation with the American Public Health Association, presents: The Battle for Health!

(Music.....Strong chord, fading out as.....)

Announcer: This week, in New York City, public health officials from almost every republic of the Americas and representatives of the United Nations, are meeting for the Wartime Public Health Conference...For them——and for all Americans ——the Columbia Broadcasting System presents this program on The Battle for Health. Later in the program you will hear Surgeon-General Thomas Parran of the United States Public Health Service introduce Brig. General James S. Simmons, this year's recipient of the Sedgwick Memorial Medal for "Outstanding Achievement in Public Health."

(Music.....Fanfare....)

Narrator: We are going to paint three pictures——two portraits and a mural. Together they will form a sketch————a panorama of the Battle for Health. Many names and events brilliant in the history of public health will not be mentioned ——but their value is inherent in the story we tell. The Battle for Health has not been a series of isolated skirmishes. It has been—— is today——an all-out, all-encompassing war against the greatest enemy of man——disease!

(Music.....Chord...)

Narrator: I wonder if you have ever heard of Lemuel Shattuck? He was a Boston citizen——born in 1793, died in 1859. In those days, as in our own, men were quick to apply the epithet——

Haggard: (In fast) Radical! Agitator!

Shattuck: That will be enough of that, Mr. Haggard!

Haggard: You deny it, Mr. Shattuck?

Shattuck: Deny what?

Haggard: That you are appearing befor this legislative committee with no other thought in mind than to arouse the people of Massachusetts into a frenzy of fear? Why? So that the medical profession can grow rich on the fruits of fear! You keep shouting "Disease!" "Plague!" "Death!" And the people shudder and shake and come running for potions!

Shattuck: That's a vile thing to say.

Haggard: Is it, now?

Shattuck: What I propose would cut

* Broadcast over the Columbia Broadcasting System in connection with the Association's 72nd Annual Meeting in New York, N. Y., October 14, 1943. This program was arranged through the coöperation of Leon Levine, Assistant Director for Education, Columbia Broadcasting System, New York, N. Y., and directed by Richard Sanville.

down the income of every physician in the state. It would make our people healthy.

Haggard: So — — — — now you are a philanthropist!

Shattuck: I am merely a man seeking to better the lot of the people of this country. I don't know why you — — — — and the other politicians — — are so against my proposal!

Haggard: Then permit me to enlighten you, Mr. Shattuck. We consider your proposals unnecessary, unGodly — — and unconstitutional!

Sound: Applause and murmur of Approbation

Shattuck: I don't understand why. This proposal is the result of an intensive study of the health conditions of Boston made at the suggestion of some of our leading citizens as well as those of the medical profession. Our report speaks for itself. Conditions in this city are abominable. It is a disease-trap — — — — a plague-center — — — —

Haggard: (Interfering) I will not hear the good name of our city of Boston so defamed!

Shattuck: Defamed? Good Lord! Since when are facts libelous? Listen to me — — — — don't interrupt! I want you to understand every word of what I say...I won't annoy you with statistics — — nor with descriptions of what we saw — — I don't think your fat stomachs are strong enough to take it. But I will give you some choice warnings...Listen to them — — unless we take immediate action — — prompt, efficient, all-embracing — — the population of Boston — — the whole state for that matter — — is facing the greatest catastrophe in the history of our nation. Smallpox, malaria, cholera, yellow fever, consumption, and a dozen other deadly diseases are ripening right now in the overcrowded, unsanitary slums of Boston. You talk of the good name of Boston! Rot! You're no more interested in Boston than I am in Siam! You represent intrenched, vested power! You fear a progressive, healthy, alert-minded populace! That is why you are against this bill to set up in the city of Boston a board charged with the responsibility of supervising the public health.. Deny that — —

Haggard: I do deny it!

Shattuck: Then why do you fight this proposal?

Haggard: I fight it on the Holy ground that God proposes and God disposes. If it is His will that plagues and disease kill the sinners — — then they must die! I fight your proposition on the ground that it is unconstitutional — — nothing in our basic law provides for the setting up of such an agency as you suggest. That is my stand!

Shattuck: You dare to call on His name to back your perfidy! Why did God, then, permit Jenner to discover the secret of vaccination? If it was His will to destroy, why did he let the genius of man discover a way to circumvent His anger? Why? Is it blasphemy to save the poor and sick?

Haggard: I — — — — I did not mean that.

Shattuck: You say it is unconstitutional. I say it is basic democracy — — and therefore the very essence of our Constitution! The agency we would set up would be empowered to abate sanitary nuisances — — check up and report on the appearance of contagious diseases in our community — — vaccinate against the

smallpox — — control the distribution and the use of patent medicines! Why — — this would be the people's health insurance — — paid for by them, controlled by them, dedicated to their own betterment. As for the Constitution — — there is a phrase in it concerning the Pursuit of Happiness, I believe — —

Haggard: Yes — —

Shattuck: There is no happiness for the sick and the afflicted. There is no freedom for the child chained to slums and fever — — nor for his parents — — weak and crippled by disease. That is my answer to your objections —

Voice: (Off mike) Wait! I want to speak —

Haggard: Who are you?

Voice: (Coming on mike) Just a plain man of Boston. From the Fourth Ward...Your Ward, Mike Haggard. Man, there is only this to say...We want to be protected against disease. This man says the way to do it is by setting up a health agency. You do it, Mike Haggard — — you hear me — — — — you do it! We people want it — — — — and we'll get it! You do it, Mike Haggard — or just as sure as the sun comes up over the Cape, you'll be patching your pants come next election!

Haggard: My dear constituent, I — — —

Voice: I'm going back to the neighborhood, Mike — — and tell the folks what I've heard! Will I tell them you will deny us the right to live? Eh, Mike Haggard?

Haggard: No — — No, of course.

Voice: You will vote for this bill?

Haggard: I — —

Voice: Speak up, man — — how will you vote?

Haggard: I — — I will vote for the bill!

(Music: Tag, full, up and under...)

Narrator: That is the first portrait — — Lemuel S h a t t u c k — — crusader, pioneer, fighter for health. Lemuel Shattuck sparked the flame of democracy in the hearts of the people — — and the people acted. The health department he fought for was established — — the first such health organization on this continent. Perhaps it was Shattuck who first inspired Stephen Smith. That was in New York — — the year — — 1864. Stephen Smith — — a young physician battling for the health of the million crushed within the limits of the City of New York. A typhus epidemic was sweeping the city, and Smith was put in charge of the hospital tents pitched on Blackwell's Island. He soon was an old hand at filling out death forms — —

Smith: What is the name of deceased, Billy?

Billy: Er — — let's see — — kind of hard to make out on this tag. O — — O'Donnell, I guess it is. That's it — — O'Donnell — — Molly O'Donnell.

Smith: Address?

Billy: Address now — — Ah — — er — — East 22nd Street!

Smith: Another!

Billy: Eh?

Smith: That's the eighth death this week from that same block!

Billy: No wonder. I know the place, I do. A little patch of brimstone in a furnace o' Hell!

Smith: Bill — — will you take me there?

Billy: You?

Smith: Yes.

Billy: And why would you want to be going to such a dive?

Smith: I want to see how the people live.

Billy: The answer is that they don't live like people, Dr. Smith — — 'tis more like cattle — — and starved cattle, at that.

Smith: Immigrants?

Billy: Aye.

Smith: Come on, Billy — — I want to see the place.

Billy: Right you are. Only plug up your nose and belt in your stomach — — 'tis not the Garden of Eden you're visiting!

(Music:...Tag in and out....)

Sound: Off mike voices — — squeals of kids running about

Billy: Whew — — and hold your nose, Dr. Smith!

Smith: (Gasping) Lord — — what a stench — —

Billy: 'Tis a well-mannered word you use.

Smith: What holds this place together?

Billy: The smell. It cements the rotten walls.

Smith: How many people do you figure live here, Billy?

Billy: None that live. About six to a room that exist.

Woman: (Coming up — — Irish) And what would you be wanting?

Smith: I'm Dr. Stephen Smith — —

Woman: Get out!

Smith: But — —

Woman: (Calls) Pete!

Smith: Now, madam, I am only — —

Pete: (Coming up) What is it?

Woman: This one has come to see the sights.

Pete: So? Pretty — — what?

Smith: I'm a doctor. I've come because — —

Pete: Because what?

Smith: Because there have been eight deaths from typhus registered from this address this past week.

Pete: Eight? Man, you're way off. Eighteen, maybe. We don't count.

Smith: Why do you stay here?

Pete: And where might we be moving to? The Astor mansion?

Smith: There are other tenements?

Pete: Aye — — with rent to pay.

Smith: You don't pay rent here?

Pete: We come and go as we please.

Smith: Who owns the property?

Pete: The devil himself.

Woman: Make him get out, Pete. We don't want him here.

Pete: Aye. Out with you — —

Smith: But — —

Pete: Out! Don't you have no respect for the dying? We're dying — — let us alone to die in peace!

(Music:...Tag in and out....)

Bryant: I know the state of the slums in this city, Dr. Smith — — but what do you expect me to do. I am a newspaper publisher — — —

Smith: Mr. Bryant, I've found out who owns the property. It wasn't easy ——because he kept his name fairly well hidden. But now I know it ——

Bryant: Who is it?

Smith: Never mind the name — just believe me when I tell you that he is one of the biggest men of the city. I have spoken to him. He refuses to renovate the place and make it habitable. There's only one way to make him act ——

Bryant: How?

Smith: Threaten to expose the conditions of his property in the public press ——

Bryant: Hm-m-m ——

Smith: Let me have three reporters ——I'll get action ——

Bryant: Right! Let's see if it works ——

(Music:...Tag in and out....)

Sound: Street noises

Smith: Here comes his carriage now. When he gets out ——go to work.

Voice 1: Watch us, Dr. Smith ——

Sound: Horses up to stop

Sound: Carriage door open and man getting out

Reporter 1: Ah ——Mr. Cooper ——

Cooper: Er ——yes.

Reporter 1: I'm from the *Evening Post.* Mr. Cooper do you have a statement to give us about your property on East 22nd Street?

Reporter 2: They call it a fever nest? What's your opinion, Mr. Cooper?

Reporter 3: Is it true that there is no provision made for the disposal of sewage in your tenement?

Reporter 1: How many people have died of ——

Cooper: What is the meaning of this?

Reporter 2: Just getting the facts for a newspaper story.

Cooper: Newspaper story? Uh —— ah ——

Smith: Mr. Cooper ——

Cooper: Dr. Smith. Please —— please ——come into my office with me.

Smith: What for?

Cooper: Ah ——er ——I've changed my mind about that tenement. Yes, indeed. I ——I'll renovate —— clean it up ——anything ——but please, Doctor ——call these men off! They musn't print a word!

(Music:...Triumphant tag in and under....)

Narrator: Stephen Smith's one-man crusade paid large and wholesome dividends. The glaring violations of the simplest principles of health that existed in the slum-centers of New York inspired a group of public-spirited physicians and laymen to take positive and immediate action ——

(Music:...Out....)

Smith: There's only one way to get the facts and prepare laws and measures to improve conditions —— an intensive, city-wide survey of conditions. I have called on you younger physicians to act as sanitary inspectors. The entire city has been divided into zones ——each one of you will be assigned to a single zone. Here's what we want! A complete, exhaustive report on conditions —— the number of people in each room ——*the state of their health* —— sanitary conditions ——each and

every fact bearing on the health of the individual. It will take time, money, effort. There will be only one reward — — a cleaner, better city. I ask for your coöperation. Do I get it?

Sound: Shout of many voices in affirmative as

(Music:..Tags solemnly and under..)

Narrator: The report of this sanitary inspection of New York City in 1865 is a classic, a masterpiece of stark, tragic, almost nauseating prose. A few excerpts — —

Voice 1: In 17 blocks, 55 houses contain 246 persons living in cellars completely underground — —

Voice 2: The mother, a wrinkled crone at thirty, sits rocking in her arms an infant with pasty and pallid features that tell that decay and death are usurping the place of health and life.

Voice 3: Sitting together upon the same broken box, lying together upon the same dirty straw, covered by the same filthy shreds, you have a picture of a mass of corruption and squalid misery gathered inside the walls of the unventilated building.

Voice 1: The attic rooms are used to deposit the filthy rags and bones that are taken from the gutters and slaughter-houses.

Narrator: Enough! But remember this — — these were not isolated conditions, found only in New York — — they were identical with the unsanitary, the fever-breeding, the death-nourishing melting pots of humanity found in almost every city of every nation on the globe. It was the result of an industrial revolution that forgot the human decencies. But times were changing. In 1865 — —

Voice 2: A Bill to promulgate a Metropolitan Health Law!

Narrator: Passed! Passed by the representatives of the people for the people's own protection! The repercussions of this triumph for municipal cleanliness were world-wide! Administered by intelligent, scientific authority, the health agency set up by the Metropolitan Health Law quickly justified its existence — — cholera disappeared from New York. Malaria, dysentery, typhus all were attacked — — all were vanquished! The death rate was halved — — halved again — — and in almost every city in the United States, the results of sanitation and regulated public health were paying tremendous dividends in human life. The Battle for Health was joined — — the issue was never in doubt!

(Music:...Up full, triumphantly and out)

Sound: Outdoor noises — — birds, etc. — — steady hum of automobile motor, broken occasionally as car bangs over a bump in road

Soper: Stop here, Bruce — —

Sound: Car up and out

Soper: (Calls) Hallo! (Pause) Hallo! Anybody around?

Wilson: It gives me the creeps, Fred — — a valley of ghosts!

Soper: (Sighs) Just about! Nobody around, I guess — —

Wilson: Probably all run off to the North — —

Soper: Not all — — look at those graves.

Wilson: Umm-m — —

Soper: (Cynically) The great and fertile valley of the Jaguaribe — — Brazil's inland empire! Look at it!

Wilson: Empty huts — — broken doors — —

Soper: And why? (Vicious slap) Because of this — a mosquito!

Wilson: Not just a mosquito, Fred — — give credit where credit is due — — a very special mosquito. Hail the Caesar of the insect world — — *Anopheles gambiae!* (Lowers voice) *Anopheles gambiae* — — dirty little devils! Come on — — lets get out of here!

(Music:...Tag in and under....)

Narrator: And this was not decades ago. This was 1938. 1938! Years after Pasteur had proved the germ theory — — Lister had demonstrated the power of sterilization — — Koch had discovered the tubercle bacillus and Ehrlich had reached the magic number of 606. Florence Nightingale had long passed away — — the names of Walter Reed and William Gorgas were in history. Landsteiner had typed blood and sanitary engineering was an honored profession. 1938! The scourge of typhus had almost disappeared from the earth — — cholera was driven back to the wild hills of Asia from whence it came — — diphtheria was conquered — — yellow fever was only a grey memory on the American continent — — the death rate from tuberculosis was slowly — — but surely — — falling! 1938 — — and an authority could still predict:

Voice: If gambiae malaria is not eradicated at once, a large part of Brazil and many other countries on the American continent face almost certain disaster!

Narrator: This was 1938!

(Music:..Up dramatically and out..)

Barreto: It is an interesting proposal you make, Dr. Soper — —

Soper: The reconnaissance trip Mr. Wilson and I have just concluded through the stricken area, Dr. Barreto, fully justifies these recommendations — —

Barreto: But complete species eradication — — that — — that is rather a startling thing. Ambitious — — perhaps too — —

Soper: One hundred thousand people have become affected — — about 20,000 have died — — since gambiae malaria entered Brazil! This specific type of malaria is rare and deadly — not the usual curable form of the disease. The only way to attack is to kill — wipe out — eradicate the source! And we can do it — —

Barreto: How?

Soper: We have a number of things on our side. One, the nature of the insect itself. Luckily, it's highly domesticated — — it only breeds near humans. We don't have to worry about it spreading in the unpopulous jungles and swamps of the interior.

Barreto: Yes — — that's true enough.

Soper: Second. we have some weapons at our command. The Yellow Fever Service that has so successfully controlled and eliminated that disease from Brazil can give us trained personnel.

Barreto: But the Service is hardly large enough to attempt species eradication of this mosquito.

Soper: Then we'll expand it! It will be expensive — — the Lord only knows how much it will cost — — but it must be done. I can only speak for the International Health Division of the Rockefeller Foundation. We are willing to contribute

money and time — — trained personnel and equipment.

Barreto: All right, Dr. Soper. I can speak for the government of Brazil. We will appropriate the necessary funds and make the suggested transfer of personnel from the Yellow Fever Service. When do you think we should start?

Soper: Now. Right now. And it's not one minute too soon!

(Music:..Tag in and up and under..)

Narrator: Now the combined wrath and genius of the Americas was turned on *Anopheles gambiae.* The spindly, brownish-yellow killer that had smuggled its way into the New World early in 1930, perhaps on a fast French destroyer, was the tiny object of the greatest man-hunt in modern history. The Malaria Service of the Northeast was not a haphazard collection of scientists, day laborers, and hangers-on! It was war — — and like all phases of modern conflict — — planning and organization preceded every move! The General Staff planned its strategy — — the cartographers made maps — — the engineers made surveys — the intelligence made reports. Then — — only then — — the infantry went into action — —

(Music:...Out....)

Sound: Knock on door

Woman: (Off mike) Who is there?

Pablo: Disinfecting squad.

Woman: Oh — — come in.

Sound: Door open

Pablo: Good morning. Where is the bedroom?

Woman: Back there. My husband is still asleep.

Pablo: Umm-m. In here, men.

Sound: Footsteps — — door open

Sound: Deep snoring of man

Pablo: All right — — open the umbrella — —

Woman: Umbrella?

Sound: Umbrella opening

Pablo: Yes. We use it to catch mosquitoes. Watch how. First we open it. It is square, you see — — that is to make it easy to get into corners. Now — — over the umbrella, I use my spray gun loaded with insecticide — — like this — —

Sound: Flit gun

Pablo: You see — — the mosquitoes that hang on the roof and the walls fall into the umbrella. So.

Woman: Then?

Pablo: Then we gather all the mosquitoes — — put them in a box and send them to headquarters at Fortaleza. They examine them and see how many gambiae we have caught! That's how they know how to control the disease. You understand?

Woman: I — — — — I think so. (Suddenly) Joao! Joao!

Joao: (Suddenly aroused) Eh? Ah?

Woman: We are being disinfected. Get up!

Joao: (Sleepily) Oh — — — — — — Oh, yes. How do you do?

Pablo: How do you do. We are sorry to disturb you, sir. We will start with this room and then work through the house to the kitchen.

Joao: (Getting up and yawning) I am going to the kitchen — — —

Woman: To eat?

Joao: No — — — — — to sleep. (Yawns) Wake me up when you get there.

(Music:..Tag in and up and under..)

Narrator: The disinfecting squads used insecticides in the homes and Paris green on every pool of open water they could find. Chief inspectors checked their work — and Post inspectors checked on them — — — — — it was an army of thousands battling an enemy of millions. Quickly the people of Brazil realized that here was a fight for their own existence. They changed from casual onlookers to active participants — — — — it became a national crusade. And then the map began to reveal wonders!

Voice 1: December, 1939 — — — — — — — Gambiae has disappeared from Cascavel and Quixada — — — — —

Voice 2: March, 1940 — — — — — Gambiae has been driven out of Assu and Ico!

Voice 3: May, 1940 — — — — — Gambiae has been eliminated from Jaguaribe!

Voice 1: July, 1940 — — — — — Gambiae has disappeared from Coera Mirim — — — — —

(Music:....Strong chord.....)

Narrator: Back — — — — — back from the interior — — — — — back almost 1,000 miles to the Atlantic Coast — — — — — the invader was driven! By September, 1940 — — — — two years from the start of the campaign — — — *Anopheles gambiae* — — — scourge of Africa — — — — was wiped off the face of America. Gone — — — — — — eradicated — — — — finished! They said it could not be done — — — — — and it *was* done! Done by the united action — — — — — the united genius of the Americas! Take pride in that — — — — all you of America — — — — hear this, and be proud. Gambiae malaria is gone — — — — — gone into limbo along with typhus and cholera and yellow fever! Will it return? Will the other scourges return? There is only one answer — — — — vigilance — — — — constant, sleepless vigilance! In the Battle for Health, all free people are united! In the Battle for Health, there is never a truce! Keep alert, America — — — — — keep strong and ever healthy!

(Music:...Sweep up full and out...)

Narrator: This week — — — — — in New York City — — — — the Wartime Public Health Conference has met the problems of disease control in a battle-torn world. The manifold difficulties of public health under these conditions is being met by united action and modern scientific control! The public health officials of the Americas and the United Nations are the staff officers in this eternal struggle for human life — — — — they are the key men, the pioneers in this never-ending crusade for better health — — for a better world!

(Music:...Up full and out....)

American Journal of Public Health
and THE NATION'S HEALTH

Official Monthly Publication of the American Public Health Association

Volume 34 | January, 1944 | Number 1

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A NEW INTEREST IN CHEMOPROPHYLAXIS

HOPES for effective *prophylaxis* in relation to communicable diseases have undergone a sort of ebb and flow in the past fifty years, as has the use of the word itself. In the beginning of this century, prophylaxis was a somewhat generic term implying a shot-gun pattern of action where one relied upon many vague doings rather than upon any one specific procedure or agent. Aside from quinine, perhaps only the asafoetida bag was conceded specific prophylactic virtues. The latter went out of fashion a generation ago, but quinine retained its reputation as a malaria preventive for a long time, until the experience of troops in areas where malaria is endemic rather strongly emphasized to medical officers a fact already known to malariologists, to wit, that the so-called prophylactic use of quinine, or atabrine, does not really prevent malaria.

It may be said, then, that during the past few decades the tide of interest in specific prophylaxis has been strongly on the ebb. At the moment, however, there seems a modest flood of hope, in that reports of research and experience in the prophylactic use of sulfa drugs are now beginning to appear in scientific journals. One is encouraged to believe that these drugs may give definite protection against gonorrheal infection, and may sharply reduce the number of meningococcus carriers, presumably lessening the individual's likelihood of contracting the disease caused by that organism.

For the most part, experiences in the prophylactic use of sulfa drugs in relation to gonorrhea and meningitis have been in the military services where conditions for observation are much more favorable than in civilian populations. How effectively agents of this sort may be employed in extra-military health work remains a question. Scattered civilians are not in the same category as a concentrated military group, where individuals are given leave only at known intervals and are under rather rigid discipline and observation before and after that leave. It must be recognized, therefore, that in civilian life, and in relation to gonorrhea, exposures do not occur at intervals in a predetermined and somewhat periodic schedule but at various times, as the possibilities of a given situation develop. Certainly one could not go on a sulfa drug diet, just in case. In further

relation to chemoprophylaxis against gonorrhea, two other considerations would inevitably arise. First, from a medical standpoint there would be some danger in self-dosage; and, second, there would be objection by those who sincerely believe that to encourage prophylaxis would be to stimulate immorality and condone sin. On the other hand, potentialities for the application of antigonorrheal drug prophylaxis in civilian life are not to be brushed aside merely because of difficulties. It is a subject worthy of exploration along many lines: scientifically, administratively, psychologically.

In the meningococcus meningitis situation, there are not so many barriers to the use of a prophylactic drug in selected instances. It would not be possible, even if desirable in the face of an epidemic of meningitis, to give prophylactic doses of a drug to an entire local population, just as it is not practicable to provide a passive immunity for all susceptibles who might possibly have been exposed, say, to measles or diphtheria. But chemoprophylaxis would be practicable in situations where cases of the disease were occurring in somewhat segregated groups of individuals. Thus, in young men in dormitories and in similar domiciliary concentrations in which meningococcus meningitis tends toward a high prevalence, specific prophylaxis under medical direction would be a measure of great importance.

Regardless of whether or not there is a sound foundation for these early promises of the prophylactic effectiveness of sulfa drugs in the diseases mentioned, this new interest in chemoprophylaxis will undoubtedly stimulate research as to possibilities with other drugs and with other diseases, and will add a badly needed fresh note to the whole subject. At best, of course, this type of protection would be transient, not comparable to a previously established and continuing active immunity. But pending the development of new antigens, and particularly in the emergency of war, new explorations in chemoprophylaxis are more than justified. It might even result in the development of a real prophylactic against malaria which, from a military standpoint, is an outcome that might well change the fortunes of a campaign.

THE EXPANDING HORIZONS OF PUBLIC HEALTH

IT would be difficult today to discover an intelligent person with a social conscience who is unaware of the recent sessions of the Council of the United Nations Relief and Rehabilitations Administration and something of the public health significance of this global effort to meet the world's critical needs. Elsewhere in this issue will be found a condensation of those reports relating to health which have come out of the sessions in Washington and Atlantic City and which should supplement the general information which has already appeared.

Those who went through World War I and were involved in the post-war efforts toward relief point to the advantage in facing these needs in a broad and systematic manner before the military phases of the war are ended and with free access to the resources of the United Nations, both material and personal. Some lessons learned 25 years ago have already given relief efforts an important advantage in the present emergency. There is more orderly planning, there are better established channels of action between the nations, a greater facility in meeting the problems of nutrition and the prevention of disease than we have ever enjoyed, and a vastly expanded resource in trained and experienced public health workers.

It can be said with confidence that the leadership in Committee IV on Relief and Rehabilitation Policies and in the Sub-Committee on Policies with Respect to Medical Care is excellent. It is fortunate that the Director General of UNRRA is so able and experienced an administrator and one so familiar with good public health practice. Herbert H. Lehman, then Governor of New York State, speaking before the American Public Health Association in 1937, said " It is my firm conviction, often repeated, that so far as science and government can make it possible, an equal opportunity for health is the right of all citizens of the community, regardless of circumstances, birth, economic conditions, geographical limitations, race, creed, or color . . . definite plans require expert preparations and supervision, with official recognition of the maxim that the health of the people is indeed the highest law." Also, " That the economic condition of a community bears a very direct and potent relation to the health and welfare of its citizens is a conviction which has continued to grow upon me for many years."

These are heartening words from the Director General and he will have no unfamiliar teammate with whom to work out these policies for Dr. Thomas Parran is Chairman of the Sub-Committee on Policies with Respect to Medical Care of UNRRA.

Health workers in an international body like the American Public Health Association have a vital interest in the personnel which will be used for such a herculean task. The record to date of OFRRO, the former American counterpart of UNRRA, which was under Governor Lehman's direction, gives reason for hope that the choice of staff will be made on a merit basis and with a judicial balancing of the relative importance of technical training and an ability to get along with people. The sources which have so far been used indicate that the Governor means what he has said about the choice of the best available persons to do the job. That there will be difficulties and obstacles, no one can doubt. That it will be hard to maintain high morale in any group long after the demobilization of the military forces is obvious. Yet the readiness of highly qualified health men and women is a matter of record and should be encouraging to all concerned.

As a statement of policy for a newly established health agency, it would seem that the declarations with respect to health and medical care are admirable, " The reëstablishment of health being one of the principal objects of relief work, it is essential that the status of the health organization should be commensurate with its importance in the work of the whole administration." It is emphasized that it is a recognized principle of administration that all work of a technical character should be carried out under technical direction. Since every aspect of the work of UNRRA will necessarily have health implications, the director of health must be afforded a position in the administration which will enable him under the authority of the Director General to develop suitable policies and to exercise proper technical direction over all health aspects of the work of UNRRA. What if each of our states and provinces were set up with a similar declaration! . . . " The status and success of UNRRA from the health point of view depend on obtaining the services of a director of health of the highest possible professional standing, whose previous work is such as to command the respect of those qualified to judge, both from the technical and administrative point of view."

For career workers in public health it must be conceded that these plans throw new perspectives around the task. To have the familiar technics and the experience of our daily work applied on a global horizon by those whom we regard as worthy of the high responsibility—that indeed is a challenge. There is no escape from

the obligation which each has to see his own part in this huge undertaking, whether abroad or at home, for if this work be well done it will have a profound influence on other international relations.

Viewed in the long perspective, UNRRA will facilitate the later development of a permanent, world-wide health organization and that may well be the framework on which an enduring international peace may be established.

Credit Lines

THE appreciative response which has arisen over Dr. Patterson's recent guest editorial "The Compleat (Annual) Reporter" (see October Credit Lines) has prompted the Editors to ask him to present another aspect of agency business, namely the writing of letters. The next voice you hear will be that of Dr. Raymond S. Patterson, Director of Health Education, John Hancock Mutual Life Insurance Company, Boston.

DO YOU NEGLECT THIS DEVICE?

Is this a fair picture of you, too?

Dr. Health Officer (or Miss Agency Executive) "with shining morning face" seats himself at his desk. His secretary brings in the first grist of mail.

Groaning loudly over the thickness of the pile, Dr. Health Officer takes up the letters and then there ensues the following monologue:

"This doctor wants some specimen containers. Refer the request to the lab., Miss Scribble. I'll answer the first part of his letter if I see him at the meeting next week."

"This woman really wants a baby booklet, I guess, but send her the other one about toddlers, too."

"Refer this request to the Welfare Association, please. Oh yes, and here's one for the Street Department Miss Scribble."

"Well, here's a letter I'll have to answer, I'm afraid." Reluctantly he begins to dictate: "Dear Mrs. Kantwayt . . ."

A tiresome inconsequential job to be gotten over quickly so as to get down to the important work of the day—such is office correspondence!

Is that your measured opinion Dr. Health Officer (or Miss Agency Executive)?

Each morning come these letters from people who want your advice, who seek information, who are in need of your services. They are coming to you for help, they are in a receptive attitude of mind, they are ripe for health education. If health education is influencing of the health habits and attitudes of the people of your community, then here is a golden opportunity to cast your bread upon the waters with an excellent chance that it will be returned to you—when you least expect it.

Don't neglect this opportunity. Instead, make the most of it. Answer questions in detail as though it were a pleasure to give the information. Let the writer know that his request for services will be complied with gladly, promptly, and completely. Then—when he is in a state of pleased surprise—say to him, "you may be interested to learn . . ." and in a couple of well-thought-out paragraphs tell him about the current health department activity that everyone in your community should know about. Public opinion is the combined opinion of individuals. You are molding public opinion in each letter.

SOMETHING ABOUT YOUR LETTER'S LOOKS

Often your letter is your first, sometimes your only, contact with your correspondent. Your representative deserves to be well dressed. You don't go, yourself, in overalls to meet your public, or allow your nurses to go in slacks and sweaters. Some letters that

I have seen—yes, from health agencies—are in about that state of undress.

Your letter should be as attractively clothed as you would be. A clean sheet of white paper of good quality, a letterhead pleasingly printed in legible type and in black or nearly black ink, your letter conventionally typed—with a new typewriter ribbon, please—in the center of the page, and with eye-soothing white margins all around. The recipient of your letter may not remember, but he glows with pleasure as he takes it from the envelope.

Some agencies—especially the tuberculosis associations— are addicted to "namitis." You may find a list of ten, twenty, *thirty* names down the left margin of the paper. No one ever reads these names but the funereal border of black competes with, and detracts from, the message you hope your correspondent will read. Why make it hard for him to concentrate with such a sideshow? A few agencies go so far as to print messages here, with subheads in red, planned deliberately to compete with the letter itself!

What about "namitis"? If there is an impressive list of Nabobs who must be named, would it not be better to print the imposing array on the back of the letter? Then all the titles and positions may be appended as well, and everyone will be impressed. If there is a message that *must* go with each letter, could it not be enclosed as an envelope stuffer? If the idea is so all-fired important could it not be written into the letter? It should deserve that much attention.

SOMETHING ABOUT WRITING

If you propose to influence your correspondents' health habits and attitudes by words, then your words had better be sharp, clear, and compelling. All of us live under a deluge of words poured on us from the radio, the press, and our neighbors. The only way we can keep our sanity is by learning to cover our minds with an umbrella of indifference. So, if you, Dr. Health Officer (or Miss Agency Executive) propose to pierce this umbrella with your words, make them good words.

Writing is a skill that grows with practice—in no way different from piano playing. Could you play even "Old Black Joe" without hours of practice? So if you would sharpen your words, whittle them with painstaking care. Make your letters models of persuasive writing. If you write good letters, you will be able to produce any other of the health educational media—with more practice.

Write critically. By that I mean, be critical of your own writing. Take time to re-write. Preferably sleep on your first effort—especially if it was dashed off in the fine white heat of inspiration—it may look a bit blue, next morning. Mrs. Shelley wisely said that the health educator should write, not so his writing can be understood, but so that it can't possibly be misunderstood. Take that to heart in your letter writing.

THIRTY-ONE STATES CONSIDER THEIR POST-WAR PUBLIC HEALTH PROGRAMS

Thirty-one state health officers are now in agreement with state plans for local health jurisdictions, arrived at jointly between them and the A.P.H.A. Committee on Local Health Units. It will be remembered that the committee exhibited maps and tabular data showing both the existing status and proposed plans for local health service at the St. Louis Meeting of the Association in October, 1942. This material, together with the minimum standards proposed by the committee, was summarized in the April, 1943, issue of the *American Journal of Public Health.**

* Units of Local Health Service for All the States. Progress Report. *A.J.P.H.*, 33, 4:404 (Apr.), 1943.

The 31 states in agreement represent 58 per cent of the population of continental United States, have a total of 2,074, or more than two-thirds of all counties, and have agreed upon 749 units of local health jurisdiction, an average of nearly 3 counties per unit.

That this was not accomplished by mere formal and unthinking agreement with committee suggestions is eloquently attested by the fact that 21 of the 31 states as now districted have a different number and arrangement of jurisdictions from those suggested by the committee in the first instance. In 14, the number of units was increased upon recommendation of the state health officer; in 7 states the number decreased. However, the number of units agreed upon in the 21 states combined is fewer than the number suggested by the committee.

Even a superficial analysis of the correspondence and the supporting material furnished by state health officers to support their variations from committee suggestions indicates the extent to which this plan has stimulated the imaginative thinking of state health officers. Discussion revealed an acute awareness of local social, geographic, economic and political factors and maps, current population, and financial data were in most cases prepared. Unless all signs are misleading, the postwar world will feel the stirrings of a movement that is gathering a sure momentum. At that time personnel back from the wars will be available and the federal government will in all probability be prepared to assist localities in financing an adequately planned and staffed public health program. The states with a plan will have first call on personnel and funds.

This movement has implications for public health education in the medical, nursing, sanitation, and related fields. As the local health officer becomes the custodian of the public health of a considerable body of citizens, his professional and economic status will be such as to justify special training for his responsibilities on the one hand, and to demand that he forego private practice on the other. Similar incentives will be present for professional training of the public health nurse and the sanitary engineer. Likewise colleges and schools of medicine, nursing, engineering, and social work will have a guide as to the number of professional personnel that will be required, as well as a fairly definite blueprint of the jobs to be done, and the financial rewards for adequate training and performance. Further, as public health jurisdictions become organized as now planned, they can serve as field work laboratories for the future training of workers.

FOR PHYSICIANS ONLY

The Subcommittee on Personal Health and Safety of the State Home and Farm Safety Advisory Committee, New York State Department of Health, is responsible for a concise, 8 page statement of the home accident problem in the state and the responsibility of the practising physician in reducing it. He is reminded of physical conditions and medications which may cause accidents, of situations which may cause trouble for infants and toddlers and of types of advice to give to mothers to prevent accidents.

"An outline of Public Health Activities for the Practising Physicians of Minneapolis," issued by the Division of Public Health, F. E. Harrington, M.D., Commissioner, is a sturdy, well printed book of 68 pages and cover. It is a straight-forward, factual, and readable account of the organization and activities of the division with "The Physicians' Participation in This Activity" concluding each section. Illustrations of forms for reporting communicable diseases and the list of reportable diseases are included in the chapter on

this subject. Several appendices make much useful and necessary information easily available for the physicians of the city. In these the existence and relation of public health activities at the federal, state, and local levels are summarized; the *International List of Causes of Death* is reproduced; some of the common communicable diseases are reviewed in a quick-reference table (one wonders why they were not arranged alphabetically); quarantine and isolation of communicable diseases and susceptibility tests and active immunizations are presented in tabular form. A final section deals with the scope of premarital examination laws in 33 states, lists of approved out-of-state laboratories and approved tests, license and residence restrictions, and sources of examination forms, and gives the periods of validity of examinations, laboratory tests and licenses.

THE HEALTH OFFICER MOVES OVER

It seems that for years the members of the West Virginia Public Health Association have been under the impression that their Constitution specifies that only a health officer may be elected to the office of President. There has been a growing dissatisfaction with the automatic ignoring of public health nurses and sanitarians which this general belief brought about. Recently the Executive Committee was stimulated by a health officer to search the Constitution and By-laws and discovered that the election of a health officer year after year to the Presidency was simply a matter of precedent. At the spring meeting, the association will vote upon an amendment which, if approved, will rotate the highest office so that a health officer, a nurse, and a sanitarian will each hold it once in every three year period. This may or may not be a good system, but that is not the point. The point is that things do not have to stay the way they are. There is a good deal of encrustation of tradition in organizational set-ups, a corner of which might well be scraped off to see what is underneath.

KNOXVILLE AND KNOX COUNTY CONSOLIDATE HEALTH SERVICES

Credit Lines reprints by permission the following news note from the November issue of the *National Municipal Review* with congratulations to Knoxville and Knox County for taking this progressive step in such business-like fashion:

"A merger of the Knoxville Bureau of Health and the Knox County Health Department took place July 1 through a written contract entered into by city, county, and state officials. The contract can be terminated by any of the parties at the end of any fiscal year provided the terminating party gives sixty days' notice. Under the contract the city must appropriate to the consolidated department at least $110,000 annually, the county a minimum of $14,000, and the state must furnish in cash, materials, and service a minimum of $70,000 a year.

Director of the combined department is the former Knoxville public health officer, Dr. W. H. Enneis; associate director is the former County Department of Health director, Dr. A. G. Hufstedler. The personnel of the city and county health departments were retained in the new department and classification and compensation for these employees will be established and maintained in accordance with a program approved jointly by the state and city civil service. Compensation of employees is not to be reduced below the salary schedule submitted to the State Health Department last May. New employees are to be selected subject to qualifications required under state and city civil service programs.

Prior to consolidation the city was spending approximately $1.30 per capita

for public health activities, and the county was spending approximately $.30 per capita. The consolidation has resulted in marked increases in expenditure and expansion of services, particularly in the rural areas where health services had been wholly inadequate."

MOTHER HAD A FINGER IN THESE

A joint project between the New York City Committee on Mental Hygiene and the Bureau of Child Hygiene of the New York City Department of Health, Leona Baumgartner, M.D., Director, has resulted in a series of 14 pamphlets on child guidance with emphasis on infant feeding. Some are for parents, and these are of two or four pages, written with the utmost simplicity and informality; some are for parents and staff; and some for staff alone. Number 1 is for parents and is headed briefly "Children Like To Eat." In easy, conversational style, maintained throughout, it elaborates the theme presented in its first paragraph:

"Good food, offered in a matter-of-fact way, without urging. There—as simple as that—are the main points in helping children to develop good eating habits."

Pamphlet No. 2 is for staff and discusses children's eating habits and instructs nurses how to instruct mothers so that good habits may be formed. This is the pattern throughout the series. The staff pamphlets provide scientific background, unencumbered by technical language, however, and instruction related to the information given the parent.

The method of development of the pamphlets is noteworthy, as Dr. Baumgartner has described it. "The staff workers, nurses and physicians," she said, "brought together the questions that they found mothers asked most frequently in baby health stations, and the problem with which they spent the most time. Preliminary drafts of pamphlets which might be expected to help in a given case were then prepared. They were mimeographed and used for a year in individual stations. Numerous staff meetings, field investigations, etc., were the result, but out of them came, we believe, a very useful series of pamphlets."

FOUR LEVELS OF GOVERNMENT

As significant for public health workers as for the city managers he addressed at their 30th Annual Conference in Chicago on September 14, is this extract from Louis Brownlow's speech as published in *Public Management* for November:

"We must remember that this world is one world. We have got to think upward from the level of local government through four levels of government. Up to 30 or 40 years ago in this country any problem that came up from the people was first subjected to this question: Is this particular task to be entrusted to local government, state government, or federal government? And still nearly all our terminology, most of our everyday language, and a great deal of our ordinary thinking is shaped by that allocation of the responsibilities of governmental services among the three principal levels of government.

"But 30 or 40 years ago our actual practice began to change, so that today we no longer allocate an activity to one or another of the three levels of government in this country. We apportion a part of it to each of the three levels. We are not nearly so much the rivals in our several jurisdictional levels that we used to be. We are not fighting each other so much as our ordinary everyday language would indicate. We are witnessing the growing up in this country of coöperative government and in our most important activities we discover that all three of the levels of government are concerned with the

proper administration of those tasks that the people have decided are governmental in nature. When we realize that and can change our language so that it will come nearer to the actual fact we will have gone a long way to the solution of many of our most vexing managerial problems. No longer can these problems be answered in terms of *either* federal *or* state *or* local government—it is *and*. I am always amazed when I hear a local government official say he is hampered by the enmity of the state or federal government because he is fighting himself. For each one of us is a citizen of all three, and we are running all three, and all three are necessary in our national system.

"But now the three levels of government are not enough, because whether we like it or not, and whether or not our thinking is sufficiently adjustable and our language sufficiently elastic, we are a part of one world. How much you are going to accomplish with your plan in your city for highways, airports, and hospitals is going to be determined not by what you do in your city, not by what is done in your state capital, not by what is done in Washington—it is going to be determined in all parts of the world. What is done in China will have a repercussion on what is done in the United States, and vice-versa. What is done in Russia will have an effect on Australia; events in the South Seas will help determine the destiny of Canada."

WORTH ACQUIRING

For its persuasive reminder of how well off we are in the Western Hemisphere, the October 15 issue of *United States Municipal News*, published by the United States Conference of Mayors, 730 Jackson Place, Washington, D. C., which is devoted to "Local Government in Conquered Europe." Read it and rejoice that you are who you are and where you are.

The November issue of *Michigan Public Health*, published by the Michigan Department of Health, Lansing, H. Allen Moyer, M.D., Commissioner, for its article on "A Training Program for Replacement Sanitarians in Michigan" by John M. Hepler, C.E., Director of the Bureau of Engineering. This is the program which called forth the editorial published in Credit Lines for August from *The Ann Arbor News*. Mr. Hepler includes in his discussion the 3 weeks' course of study given at the University of Michigan and offers the plan as a solution of the sanitation problem in other states for the emergency.

"New Tools for Learning about War and Post-War Problems," a guide to films, pamphlets, and recordings for teachers, speakers, and discussion leaders, for its section on Achieving Victory on Home Front Problems which includes materials on health and welfare, juvenile delinquency and the school. Published by New Tools for Learning, 280 Madison Avenue, New York, N. Y.

"About Us and Our Friends" and "First Steps to Health Education," a guide to the former, published by the School Health Bureau of the Welfare Division, Metropolitan Life Insurance Company, New York, N. Y., for many suggestions to nursery, kindergarten, and primary school teachers concerning basic school health activities. The foreword to the guide by Donald B. Armstrong, M.D., credits Marjorie L. Craig and Grace T. Hallock with its organization under the guidance of Sally Lucas Jean and Julia Wade Abbott.

"The Proposed Program of Inter-American Activities" of the American Legion, for its framework upon which might be hung any program for community action. Published by the National Americanism Commission at National Headquarters, The American Legion, Indianapolis, Ind.

The August issue of *Tic,* published by Ticonium, 413 North Pearl Street, Albany, N. Y., for its bird's-eye view of the compulsory and voluntary sickness insurance programs in 38 countries. We have in mind a large bird with an enormous eye because 5 double-spreads of 14 columns each are required to present the data. The year of enactment, population, number of physicians and dentists, cost, administration of funds, cash and medical benefits, restrictions, and other information are given for each country.

WHAT IS BEING DONE IN ADULT EDUCATION?

A list of developments in the field of adult education prepared by a health educator presents a miscellany of interesting things which we have not seen brought together before. The list follows:

1. The U. S. Public Health Service has developed an experimental in-service program conducted for its own employees in health education. They have sponsored courses, workshops and scholarships in health education for teachers and there has been considered an extension of this work into a wider governmental field.

2. The U. S. Public Health Service has directed demonstrations in 90 southern areas on the use of teachers during the summer months for community education for malaria control.

3. A national nutrition program has had the participation of many government offices, state and local official and nonofficial agencies, and commercial organizations. This program has set an interesting pattern for the utilization of the resources of business for health education under government direction.

4. The Federal Public Housing authority has appointed a director of health education and is urging its project service advisers to assist in the development of health education programs in the housing projects.

5. An extensive adult education program through the Office of the Coördinator of Inter-American Affairs has been under way during the year in a very comprehensive way.

6. The National Safety Council and its local affiliates have developed programs on safety education aided by industry, the War Production Board and other government agencies and the American Public Health Association are planning to extend safety programs through health departments.

7. Illinois has created a large, State-wide Public Health Committee to promote better understanding of public health in the governmental set-up. Similar committees have been under way in Nebraska, and California has sponsored local health institutes.

8. Illinois, Indiana, Oklahoma, and North and South Carolina, among other states, have initiated programs of training health education personnel for their health departments.

9. Local health education programs have been under way notably in Boston, New York, Hartford, Bridgeport, Detroit, and in local areas in North and South Carolina and Oklahoma.

10. The Cleveland Health Museum has developed numerous health exhibits for adults.

11. The planned Parenthood Federation of America has developed materials on family planning in relation to public health.

12. The American Film Center, Inc., New York, has developed a new and excellent annotated list of health films for lay audiences.

13. The American Public Health Association has published an official report on the Educational Qualifications of Health Educators as one of a series of standards for personnel in professional public health work.

The American Public Health Association has developed objective methods for the examination of public health nurses, health officers, public health laboratory workers and sanitarians, as well as methods for the examination of other specialists in public health work.

14. The National Tuberculosis Association, together with the North Carolina State Tuberculosis Association, has sponsored an institute for tuberculosis workers.

15. The Commonwealth Fund and the Institute for Inter-American affairs have granted health education Fellowships for adults.

16. The University of California School of Public Health is offering a special course in health education to meet the needs of Latin Americans.

17. The Central Council for Health Education in London has begun issuing a new quarterly health education journal.

(Adapted from Public Health Education Section on New Developments in Health Education, Homer N. Calver, *Chairman.*)

PERHAPS THERE'S AN ARGUMENT HERE

Credit Lines submits a "Suggested Five Foot Shelf of Basic Books for Public Health Workers" and asks its readers if they find themselves in violent disagreement with any part of it. This was prepared by a Committee of the National Health Library, with heavy borrowing from the opinions of A.P.H.A. Section Secretaries.

Administrative Medicine. *Emerson.*

American Illustrated Medical Dictionary. *Dorland.*

Control of Communicable Diseases. *American Public Health Association.*

Community Health Organization. *Hiscock.*

Community Organization for Health Education. *American Public Health Association.*

Diagnostic Procedures and Reagents. *American Public Health Association.*

Educating for Health. *Hill.*

Evolution of the Public Health Movement. *Winslow.*

Food Poisoning. *Dack.*

Handbook of Communicable Diseases. *Top.*

Health in Schools. 20th Year Book. *American Association of School Administrators.*

International List of Causes of Death (5th ed.) and Joint Causes of Death (4th ed.) 1940. *Government Printing Office.*

Introduction to Medical Biometry and Statistics. *Raymond Pearl.*

Manual of Industrial Hygiene. *National Institute of Health.*

Manual of Public Health Nursing. *National Organization for Public Health Nursing.*

Mental Hygiene in the Community. *Clara Bassett.*

Municipal and Rural Sanitation. *Ehlers and Steele.*

The Newer Knowledge of Nutrition. *McCollum, Orent-Keiles and Day.*

Nursing—A Community Health Service. *Amy Grant.*

Nutrition in Health and Disease (9th ed.). *Lenna Cooper, Edith Barber and Helen Mitchell.*

Occupation and Health—an Encyclopedia of Hygiene, Pathology and Social Welfare. *International Labour Office,* Vol. I—1930, and Vol. IV—1934.

Preventive Medicine and Hygiene (6th ed.). *Milton J. Rosenau.*

Principles of Medical Statistics. *A. Bradford Hill.*

Public Health Administration in the United States. *Smillie.*

Public Health Law. *Tobey.*

Rural Health Practice. *Mustard.*

Social Work Yearbook. *Russell Sage Foundation.*

Standard Methods for the Examination of Dairy Products. *American Public Health Association.*

Standard Methods for the Examination of Water and Sewage. *American Public Health Association.*

Textbook of Bacteriology. *Zinsser and Bayne-Jones.*

Your Community. *Colcord.*

Ways to Community Health Education. *Hiscock.*

BOOKS AND REPORTS

All reviews are prepared on invitation. Unsolicited reviews cannot be accepted.

Anopheles Gambiae in Brazil, 1930–40—*By Fred L. Soper and Bruce D. Wilson. New York: The Rockefeller Foundation,* 1943. 262 pp.

The events that transpired from March, 1930, when Shannon discovered *Anopheles gambiae* at Natal, Brazil, through the subsequent devastating epidemic of *Anopheles gambiae*-transmitted malaria, and culminating with the eradication of this dreaded vector following a carefully planned and executed control program, are well described in this important report. Included are sections devoted to the description of the imago, pupa, larva and egg of *A. gambiae* as well as pertinent information concerning its ecology. There is a detailed account of the region invaded and the subsequent spread of this transposed mosquito which came from Africa and multiplied at a prodigious rate in a very favorable climatic area, probably in the absence of most of its natural enemies.

The malarial epidemic that followed in the wake of the gambiae invasion in 1938 was as severe as any recorded when compared to the area involved. In the first half of that year there were at least 100,000 cases with a minimum of 14,000 deaths. Faced with the problem of interrupting the epidemic and stemming further spread of the mosquito, the health authorities of the Brazilian Government and The Rockefeller Foundation undertook a joint enterprise of species eradication.

A plan of organization is described which fortunately utilized the personnel facilities and experience of the Brazilian National Yellow Fever Service. Combined control measures designed to remove *A. gambiae* from Brazil were instituted at the periphery of the area covering several thousand square kilometers and known to harbor the imported mosquito. Following a definite plan of attack which included anti-larval and adult spraying, disinsectization of all vehicles entering or leaving the area, and treatment, this border was pushed back so that by 1940 no specimens of the mosquito could be found and it was decided that there was no justification for the continuation of work. The remainder of the report is devoted to a thoughtful consideration of the problem of species eradication and the desirability of instituting similar efforts against the vectors of malaria in other areas rather than being satisfied with temporary control measures.

Few have had the opportunity or responsibility of deciding a course of action when a dangerous transmitter of disease breaks through its boundary and establishes itself in a new favorable area. Still fewer have had the foresight to plan a ruthless campaign and then remove bodily the last invader. That the last *A. gambiae* in Brazil has been destroyed seems well established, although even without new introductions there would remain some doubt for a few years until a definite statement could be made to this effect.

Unfortunately there is a factor that may mar the picture, namely, increased air transportation facilities from the endemic Anopheles area in Africa to Brazil. A doubt will be created as to the origin of any future wild-caught *A. gambiae* mosquitoes unless they should be found in large numbers in foci far from the port of entry. However, for the epidemiologist it is a clear-cut ex-

posé of what can happen when the world shrinks as the result of more rapid transportation, and for those concerned with the control of imported vectors or diseases it is an example of what can be done. No credit can be taken from this undertaking when it is stated that the habits of *A. gambiae* are such as to make them more easily destroyed by direct attack and that the production of other Anopheles of the Nyssorhynchus group rapidly returned to the pre-control levels at the termination of the campaign.

The successful methods and results of a never before tried large-scale campaign of species eradication as recorded in this concise, well written book will go down in the annals of major public health achievements.

L. T. COGGESHALL

Rheumatic Fever in Children—Its Recognition and Management—*New York: Metropolitan Life Insurance Company,* 1943. 29 pp.

Rheumatic fever is assuming greater importance as reports come in from examination of draftees and a more searching analysis is made of vital statistics. Bureau of the Census reports reveal that rheumatic fever now heads the list of causes of death among children 5 to 14 years of age. It is also an important cause of disability and death in older age groups.

It is therefore timely that a trustworthy publication should be issued having the approval of The American Heart Association, The American Academy of Pediatrics, the U. S. Children's Bureau, and the U. S. Public Health Service. Outstanding authorities have contributed to the development of this helpful booklet. The importance and nature of rheumatic fever are well stated. In clear, concise paragraphs, the diagnosis, course, and prognosis are set forth. The sections on the care of the child and follow-up care during the inactive stage are especially helpful. The publication is made more valuable by the appendices which describe the technical procedures for the examination of the heart, sedimentation methods, etc.

This booklet deserves wide circulation and should be placed in the hands of public health personnel as well as distributed to those engaged in clinical medicine. RICHARD A. BOLT

Handbook of Tropical Medicine—*By Alfred C. Reed and J. C. Geiger. Stanford University: Stanford University Press,* 1943. 188 pp. Price $1.50.

The authors have attempted to summarize the most important clinical, laboratory and preventive aspects of tropical diseases in this pocket volume of 188 pages. Such a task is extremely difficult and the authors have succeeded moderately well in their attempt. This book will serve a useful purpose for civilians and military physicians who do not have larger and more extensive works on tropical medicine available. Unfortunately there are no illustrations in the book which limits its use for those interested in the diagnosis of tropical diseases by laboratory methods.

The treatment of each disease is briefly covered and in general standard drugs and dosages are employed.

H. W. BROWN

Chronic Pulmonary Disease in South Wales Coalminers—*II. Environmental Studies. Medical Research Council. Special Report Series No. 244. London: His Majesty's Stationery Office,* 1943. 222 pp. Price, $3.00.

This second report on chronic pulmonary disease in coalminers presents the results of the committee's attempt to measure the effects of certain environmental factors on the development of pneumokoniosis among colliers in the South Wales fields. Coal mining is not in itself considered a major cause

of silicosis, and it was believed that physical studies of the workers' environment and chemical and petrographic analyses of the dusts might throw further light on the etiology of pulmonary abnormalities found in this group.

On the basis of its investigations the committee concludes:

1. That the incidence of pneumokoniosis appears to be influenced neither by the temperature at the coalface nor by the humidity of the air.
2. That there is no correlation between the concentration of nitrous fumes from blasting and the incidence of pneumokoniosis.
3. That there is a significant association between the average mass concentration and the ash concentration of the dust and the incidence of pneumokoniosis.
4. That a relationship exists between the incidence of pulmonary abnormalities and the degree of metamorphism in the shales worked. Whether this is a direct relationship is unknown.
5. That while it is not possible to say that the quartz content of the dust is not the chief determinant of the pulmonary abnormalities found, the interaction of various other constituents must be considered in the etiology of the atypical form of pneumokoniosis found in this area.

Workers in the field of pneumokoniosis will be impressed by the authors' discussion of the question of what type of dust measurement best represents the hazard to workers exposed, and the relation between mass concentration and particle counts of the dusts. Equally pertinent is the caution that as a result of changes in methods of mining during the past twenty to thirty years present environmental conditions may now be very different from those under which the existing pathology developed. Although written for the technical worker this report is of interest to everyone concerned in the effects of environment on the development of pulmonary disease. ALTON S. POPE

A Study of Public Relations—*By Harold P. Levy. With an introduction by Mary Swain Routzahn. New York: Russell Sage Foundation,* 1943. 165 pp. Price, $1.00.

A Study in Public Relations, by Harold P. Levy, Research Associate of the Russell Sage Foundation, is, according to its own introduction, " the story of what has been done by one agency during a given period under a particular set of circumstances." Herein lie both its strength and its weakness. As a case study of the background, organization, and activities of the public relations division of the Pennsylvania Department of Public Assistance, Mr. Levy's book is informative. Students of social work interested in learning the set-up and specific problems facing a state-wide public relations program will find this book worth reading. Apart from its value as a documentary report of the Pennsylvania program, however, the volume has a limited appeal. Persons with even a passing acquaintance with the fundamentals of public relations will find few new ideas expressed in its chapters. The subject of newspaper releases, speeches, pamphlets, and other media are evaluated in a routine manner only. The importance of radio as a major instrument for moulding public opinion seems underestimated by the Pennsylvania Department of Public Assistance. Many of the findings relate exclusively to the particular project described and cannot be applied with any degree of accuracy to public relations projects in general.

Perhaps the greatest service provided by this book, aside from its value as a factual report on the Pennsylvania program, is the emphasis that it places on the importance of public relations " as a specific and definite function " for every large-scale social service enterprise. In convincing skeptics that even social service agencies can benefit from an aggressive public relations program, Mr. Levy's book makes a very real contribution, indeed.

FRANK A. CALDERONE

Annual Review of Physiology—*By James Murray Luck and Victor E. Hall. Annual Reviews, Inc.*, 1943. 613 pp. Price, $5.00.

If it is true that all health rules are good only so far as they conform to the findings of human physiology, then public health workers might as well make themselves more familiar with these findings.

Volume V of this *Annual Review* gives, in a very compact way, proven facts instead of the widely circulated beliefs and assumptions about the functioning of the human body.

Going along with the present trend there are many articles in the field of nutrition, such as: Energy Metabolism, The Digestive System, Liver and Bile, and Metabolic Functions of the Endocrine System.

The field of Physiology of Reproduction is covered by: Physiological Aspects of Genetics, Physiology of Mamalian Semen, and Endocrinology of Reproduction.

Other subjects reviewed in detail are: The Functional Psychoses and Physiological Correlates of Behavior.

Many experts have contributed, and the bibliographies are detailed and extensive. BRUNO GEBHARD

As the Child Grows—*By Helen Brenton Pryor, New York: Silver Burdett Co.*, 1943. 400 pp. Ill. Price, $3.00.

You, Your Children and War—*By Dorothy W. Baruch. New York: Appleton-Century*, 1942. 234 pp. Ill. Price, $2.00.

Children Have Their Reasons—*By Ruth Wendell Washburn. New York: Appleton-Century*, 1942. 257 pp. Ill. Price, $2.00.

In these books three well known teachers have echoed and interpreted much of the knowledge which intensive studies of children's growth and behavior have revealed in the past two decades. All three emphasize the point of view that although there is a general pattern which can be expected of children of different ages, each child has his own individual pattern. However, the three authors tell their stories in quite different fashion.

Dr. Pryor tackles the problem in a direct fashion, discussing, from the more academic point of view, the factual knowledge which has been accumulated. Tables and charts are numerous. A carefully annotated bibliography is of particular value, but the short paragraphs on various medical topics, details of embryonic development, lists of 100-calorie portions, and other such more or less technical material, do not seem so. Such materials will probably interest the college student but the public health worker will probably find them a part of his background or wish fuller information.

Dr. Baruch has taken her knowledge of children and discussed the questions which parents, teachers, and others associated with them are asking in these war days: What can I do to help children and myself remain normal? What to tell children of hating, and killing, and democracy? Dr. Baruch's volume is timely, chatty and full of stories of how different individuals are solving these problems.

From the east coast comes the third volume, from the pen of one of the most beloved of children's "specialists," Dr. Ruth Washburn, who has always said she would never write a book about children. It is the belief of this reviewer that for years to come many will be grateful that Dr. Washburn finally decided she, too, had something to say. Here are the wisdom, humor, understanding, and kindliness that Dr. Washburn has learned from children in the lifetime she has spent with them. And woven also into the fabric is the extensive scientific knowledge she gained in the 15 years she was

at the clinic of child development at Yale University. She is particularly adept in explaining children's ways to adults. Her technic of drawing illustrations from adult experience is peculiarly effective. The title of the volume, "Children Have Their Reasons," expresses the spirit of the presentation or, as Dr. Washburn says, "What parents need is not so much rules or behavior prescriptions—these may make robots of them. It is insight they need, and that selfishness which makes it possible to say each time a child's behavior is puzzling or irritating, 'If I were in his shoes, what would be my reasons, my excuses, my explanations?'" It is a volume that one reads and re-reads with joy and profit.

LEONA BAUMGARTNER

Managing Your Mind—*By S. H. Kraines, M. D. and E. S. Thetford. New York: Macmillan,* 1943. 374 pp. Price, $2.75.

This book will likely appeal to the person of good education, rather than to the average person or the psychiatrically trained. There is good description of the advances in psychosomatic medicine and various types of purely psychological symptoms of the psychoneuroses.

Those readers who are familiar with Freudian literature may be resentful of the fact that some of the basic Freudian concepts are used as a basis for explanation of these symptoms but that the rôle of the unconscious is largely ignored or minimized. The description of various psychological mechanisms uses the exact terminology of psychoanalysis, but there is no indication of their Freudian origin, and the general impression left is that they are conscious mechanisms.

The leaving out of the rôle of the unconscious enables the authors to appeal to the intellect of the reader and leave the impression that an individual can obtain conscious insight and control over his psychoneurotic symptoms. While the authors give adequate and repeated warning about self diagnosis and self treatment, the whole purpose of the book and the way it is written is to convince the lay reader that he can cure himself, so to speak. Since the major portion of the book is devoted to psychoneurotic symptomatology, one may be a bit pessimistic about the author's optimism in this direction.

In the latter part of the book, which is devoted to living a healthy life, the authors are on safer ground. In general their discussion of sex and marriage, a philosophy of life, intellectual objectivity, emotional maturity, self-reliance, and the use of one's energies represent good mental hygiene.

JAMES M. CUNNINGHAM

Housing Yearbook, 1943—*Edited by Hugh R. Pomeroy and Edmond H. Hoben. Chicago: National Association of Housing Officials.* 159 pp. Price, $3.00.

This volume provides a useful handbook of housing developments during a year which witnessed the consolidation of sixteen federal agencies into one central body, the National Housing Agency. The problems confronting that agency —including the scheduling of new construction to meet the needs of war industry, the procurement of critical materials, and the control of occupancy to assure the housing of workers most in need of it—are reviewed by the National Housing Administrator, who points to the substantial accomplishment of a million and a quarter new housing units completed or scheduled under the defense and war housing programs up to March, 1943.

Activities of the three branches of NHA (Federal Public Housing Authority, Federal Housing Administration, and Federal Home Loan Bank Administration) are summarized by

their respective commissioners, and the administration of federal rent control by the Office of Price Administration is also reviewed. Not to be overlooked in any review of the national housing program is the rural work of Farm Security Administration, whose camps for migratory farm workers, combining shelter with programs of medical care, have been transferred to NHA but continue as an important factor in meeting the war housing need.

The Yearbook includes a useful directory of official and unofficial housing agencies, both local and national, with listings of their key personnel.

ALLAN A. TWITCHELL

Drying and Dehydration of Foods—*By Harry W. Von Loesecke. New York: Reinhold,* 1943. 302 pp. Price, $4.25.

The author has prefaced the book with the statement that its purpose " is an attempt to place before those interested in food dehydration a compilation of the latest practical information dealing with this subject. The data presented are not considered as giving a complete picture of the science of food dehydration. It was believed that the book would serve best if set forth without attempting an exhaustive treatment of the subject."

Chapter 1 is devoted to descriptions of the various types of dehydrators and a brief discussion of the important factors involved in drying. Chapters 2, 3, 4, and 5 present the methods used for the sun-drying and dehydration of fruits, dehydration of vegetables, eggs, milk, butter, meat, fish, and beef blood. Dehydration costs are analyzed in Chapter 7. Readers concerned with the public health aspects of the rapidly expanding food dehydration industry will be particularly interested in that portion of the text devoted to a discussion of Plant Sanitation, Nutritive Value of Dried and Dehydrated Foods, and Packaging and Storage. The final chapter deals with Methods of Analysis, and Reconstitution of Dehydrated Foods.

The purpose of this book has been accomplished in that it is a well prepared compilation of much of the recent practical information regarding the drying and dehydration of foods. Suggested readings listed at the end of each chapter and references included in the text form a bibliography for those who desire detailed information on any particular phase of the subject. A partial list of patents pertaining to dehydration of foods is given.

In view of the importance of inert gas packing as a means of protecting certain dehydrated foods, such as dried whole milk, carrots, and cabbage, it would have been well to have discussed the factors involved in gas packing, and to have presented a more critical evaluation of the effectiveness of the various methods which have been proposed for commercial use.

The text contains the statement that whole dry milk is packed in 1, 5, 25, and 50 pound cans which are evacuated, the vacuum replaced by nitrogen, and the containers then vacuum sealed. We presume that the author intended to state that the containers are hermetically sealed rather than vacuum sealed, since the nitrogen filled cans are sealed hermetically at atmospheric pressure.

A brief discussion of the difficulties peculiar to the gas packing of whole dry milk would have been a valuable addition to the practical information given regarding the packing of products of this type. Although a glossary has been included, it appears to be composed chiefly of terms previously explained in the text.

H. L. SIPPLE

Sanitary Products. Their Manufacture, Testing and Use—*By Leonard Schwarcz. New York: MacNair-Dorland,* 1943. 287 pp. Price, $5.00.

The purpose of this volume is to compile and discuss under one cover a few of the many aids used by man to promote sanitation and thereby reduce the spread of disease. The chapters are complete in themselves, each covering a distinct product or subject.

The author introduces his subject with a chapter on the history of bacteria which sets the stage for the later chapters on their control with disinfectants, insecticides, soaps, waxes, and the like. He defines such words as "germicidal" and "bactericidal." Insects, roaches, bedbugs, moths, and many other pests are discussed.

The author's method of presenting the subject emphasizes its importance to human beings and to their economy, and produces a desire on the part of the reader to become more familiar with these combating agents. The book is written in such a manner as to be of interest to laymen as well as to those engaged professionally in this work.

ARTHUR P. MILLER

BOOKS RECEIVED

ARE YOU ALLERGIC? By Jessamine Hilliard and Charles C. Coghlan. New York: Barrows, 1943. 248 pp. Price, $2.50.

WHITE BLOOD CELL DIFFERENTIAL TABLES. By Theodore R. Waugh. New York: Appleton-Century, 1943. 126 pp. Price, $1.60.

ELEMENTS OF MEDICAL MYCOLOGY. By Jacob Hyams Swartz. New York: Grune & Stratton, 1943. 179 pp. Price, $4.50.

THE COMPLEAT PEDIATRICIAN: PRACTICAL, DIAGNOSTIC, THERAPEUTIC AND PREVENTIVE PEDIATRICS. By W. C. Davison. 4th Ed. Durham, N. C.: Duke University Press, 1943. 270 pp. Price, $3.75.

THE HEALTH OF CHILDREN IN OCCUPIED EUROPE. Washington: International Labor Office, 1943. 41 pp. Price, $.25.

CONTROLLING JUVENILE DELINQUENCY: A COMMUNITY PROGRAM; 28 pp. UNDERSTANDING JUVENILE DELINQUENCY; 52 pp. Washington: Children's Bureau, U. S. Department of Labor, 1943. Price, $.10 each.

CHILDREN WITH CEREBRAL PALSY; 32 pp. CHILDREN WITH SPEECH DEFECTS; 24 pp. THE EDUCABLE MENTALLY HANDICAPPED CHILD IN ILLINOIS; 46 pp. THE EPILEPTIC CHILD IN ILLINOIS; 40 pp. Chicago: Illinois Commission for Handicapped Children, 1943.

HEALTH FOR YOUNG AMERICANS. By William E. Burkard, Raymond L. Chambers, and Frederick W. Maroney. New York: Lyons & Carnahan, 1943. 375 pp. Price, $.75.

TWENTY YEARS OF MEDICAL RESEARCH. By Dorothy White Nicolson. New York: National Tuberculosis Association, 1943. 97 pp. Price, $.50.

CIVILIAN WAR SERVICES: AN OPERATING GUIDE FOR LOCAL DEFENSE COUNCILS—OCD No. 3626; 40 pp. HEALTH SERVICE IN WAR TIME—OCD No. 3627; 15 pp. MANUAL FOR VOLUNTEER OFFICES—OCD No. 3629; 64 pp. THE NEIGHBORHOOD IN ACTION—OCD No. 3630; 32 pp. THE UNITED STATES JUNIOR CITIZENS SERVICE CORPS—OCD No. 3623; 20 pp. Washington: U. S. Office of Civilian Defense, 1943. $.10 each.

OCCUPATIONAL LEAD EXPOSURE AND LEAD POISONING. A Report Prepared by the Committee on Lead Poisoning of the Industrial Hygiene Section of the American Public Health Association. New York: American Public Health Association, 1943. 67 pp. Price, $.75.

ADMINISTRATION OF RELIEF ABROAD: A Series of Occasional Papers. American Aid to Germany, 1918–1925, by Sidney Brooks, Together with The Long Mile Beyond Berlin, by Shelby M. Harrison. The American Friends in France, 1917–1919, by Rufus M. Jones, Together with Problems Involved in Administering Relief Abroad, by Clarence E. Pickett. American Red Cross Famine Relief in China, 1920–1921, Report of the China Famine Relief, American Red Cross. The American Red Cross in the Great War, 1917–1919, by Henry P. Davison. The American Relief Administration in Russia, 1921–1923, by H. H. Fisher. The Near East Relief, 1915–1930, by James L. Barton. Recent Relief Programs of the American Friends in Spain and France, by John Van Gelder Forbes, and the American Friends Service Committee. Each edited by Donald S. Howard. New York: Russell Sage Foundation, 1943. 28 pp. each. Price, $.20 each.

MANUAL OF INDUSTRIAL NUTRITION. By Food Distribution Administration, Nutrition and Food Conservation Branch, U. S. Department of Agriculture. Washington: U. S. Government Printing Office, 1943. 25 pp.

PLANNING MEALS FOR INDUSTRIAL WORKERS. By Food Distribution Administration, Nutrition and Food Conservation Branch, U. S. Department of Agriculture. Washington: U. S. Government Printing Office, 1943. 28 pp.

HANDBOOK ON PHYSICAL FITNESS: For Students in Colleges and Universities. By U. S. Commissioner of Education Committee, with U. S. Army, U. S. Navy, U. S. Public Health Service, and Physical Fitness Division of Office of Defense Health and Welfare Services. Washington: U. S. Government Printing Office, 1943. 140 pp. Price, $.25.

PHYSICAL FITNESS THROUGH HEALTH EDUCATION FOR THE VICTORY CORPS. By U. S. Commissioner of Education Committee, with U. S. Army, U. S. Navy, U. S. Public Health Service, and Children's Bureau. Washington: U. S. Government Printing Office, 1943. 98 pp. Price, $.20.

OHIO RIVER POLLUTION SURVEY: Final Report to the Ohio River Committee. Vol. I, Vol. II, Vol. III—793 pp. Supplement "A"—Collection of Data on Sources of Pollution, 79 pp.; Supplement "C"—Acid Mine Drainage Studies, 68 pp. Cincinnati, Ohio: Federal Security Agency, U. S. Public Health Service, 1942.

THE ROCKEFELLER FOUNDATION—INTERNATIONAL HEALTH DIVISION: ANNUAL REPORT, 1942. New York: The Rockefeller Foundation, 1943. 194 pp.

EDUCACION HIGIENICA. By Dr. Manuel Gonzalez Rivera. Mexico City: Escuela de Salubridad e Higiene, 1943. 320 pp.

DISTRIBUTION OF HEALTH SERVICES IN THE STRUCTURE OF STATE GOVERNMENT. PUBLIC HEALTH BULLETIN No. 184. By Federal Security Agency, U. S. Public Health Service. 3rd ed. Washington: U. S. Government Printing Office, 1943. 340 pp. Price, $1.10.

A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

RAYMOND S. PATTERSON, PH.D.

Principles vs. Practice in Milk Testing—An inquiry was made into the practices of certain milk testing laboratories. Among those under scrutiny, none met all the "standard methods" requirements on equipment and procedure. Practically every item was violated by some laboratory sufficiently to influence the accuracy of the analysis, though every item was adhered to by several laboratories. Among the 168 items relating to plate counts the mean deviation was 32. Two more reports upon other phases of this study are to come: they should make equally interesting reading.

BLACK, L. A. Surveys of Milk Laboratories in War Areas in the United States. Pub. Health Rep. 58, 44:1605 (Oct. 29), 1943.

Vaccinia from Chick Embryos—Vaccine cultivated for 9 years on chick embryos induces a milder lesion than calf virus, but there was found no substantial difference in the degree of immunity attained.

BUDDINGH, G. J. The Pathogenic and Antigenic Properties of Dermal Vaccinia Virus Propagated in the Chorio-Allantois of Chick Embryos. Am. J. Hyg. 38, 3:310 (Nov.), 1943.

Chicago Intensive Treatment Center—In this preliminary report upon 931 patients given fever-chemotherapy for syphilis, the safeguards which should be applied to the intensive methods are described.

BUNDESEN, H. N., *et al.* The Intensive Treatment of Gonorrhea and Syphilis. J.A.M.A. 123, 13:816 (Nov. 27), 1943.

Quote—I've found the best way to bring a shadow of warmth into an editor's jaundiced eye is to show him good glossy pictures—and then mildly suggest there might be a story with them. Unquote.

COOK, B. I Like My Job! Pub. Health Nurs. 35, 11:634 (Nov.), 1943.

Social Medicine—Fighting Words—Our United States and Canada are the only countries in which organized medicine has itself set under way health insurance plans under its own auspices. So begins a review of the schemes created by the medical societies. This is a continued story and some of it is "writ sarkastick."

DAVIS, M. M. Health Insurance Plans under Medical Societies. Med. Care. 3, 3:217 (Aug.), 1943.

Here Is News—After years of discussion about the possibilities of preventing caries by the addition of fluorine to the water, something is to be done about it. So take off your hats to these brave pioneers. Two cities with comparable populations have been selected. To one water supply sodium fluoride will be added and dental examinations will be conducted in both communities.

DEAN, H. T. Domestic Water and Dental Caries, (and) AST, D. B. A Program of Treatment of Public Water Supply to Correct Fluoride Deficiency, (and) WOLMAN, A. What Are the Responsibilities of Public Water Supply Officials in the Correction of Dental Deficiencies? J. Am. Water Works A. 35, 9:1161 (Sept.), 1943.

Games, Athletics, Out-door Activities, et al.—Canada, too, proposes to go in for physical fitness in a large and official way. A map of the highways to health is furnished.

HEAGERTY, J. J. The National Physical Fitness Act. Canad. J. Pub. Health. 34, 10:465 (Oct.), 1943.

Where Accidents Vie with Disease—Before the war there were five million Americans enjoying major or minor orthopedic impairments. What the number will be this year is anyone's guess. Rates for age and sex are given.

KARPINOS, B. D. The Physically Handicapped. Pub. Health Rep. 58, 43:1573 (Oct. 22), 1943.

For TB Case Finders—This item will interest only those who are actively concerned with mass chest x-raying and probably all such will have seen the original article, but just in case they haven't, it is about a gadget which times the exposure resulting in a saving of labor, and fatigue.

MORGAN, R. H. The Automatic Control of Exposure in Photofluorography. Pub. Health Rep. 58, 42:1533 (Oct. 15), 1943.

Medically Poor States—Disturbing pictures of the per capita supply of physicians are limned. Twenty-eight states will have more than 1,500 persons per doctor and 7 of these will have more than 2,000.

PERROTT, G. ST. J., and DAVIS, B. M. The War and the Distribution of Physicians. Pub. Health Rep. 58, 42:1545 (Oct. 15), 1943.

Slaves of Fashion—Does public health concern itself with the matter of up-swept hair-do's? If so, here is an account of some unfortunate ladies who developed a most unpleasant dermatitis because they tried to varnish their stray locks in place.

SCHWARTZ, L. An Outbreak of Dermatitis from Hair Lacquer. Pub. Health Rep. 58, 44:1623 (Oct. 29), 1943.

Diphtheria in England—Before immunization in England one child in 10 contracted diphtheria; one in 200 died. Though the proportion of immunized children is still far from satisfactory, there is much to be thankful for today, for the risk of an immunized child contracting diphtheria is 12 times less than for an unprotected infant, and the risk of his dying is more than 100 times less.

SCOTT, J. A. Diphtheria: 1. Administrative Aspects (and two related papers). Pub. Health. 57, 2:14 (Nov.), 1943.

How the Master Race Is Fed—Everyone who is interested in learning how well the German civilians are fed, will find factual material here based upon on-the-spot studies up to May, 1942, and from information received since. As you may surmise they are not eating heartily.

SPICKNALL, C. G., *et al.* The Diet in Germany and the Occupied Countries during the Second World War. Pub. Health Rep. 58, 46:1669 (Nov. 12), 1943.

While There Is Yet Time for Planning—Canadian proposals for a public medical service are viewed in their relationship to the primary material necessities of life—food, shelter, and a job. Ability to meet promised benefits is considered and with the questioning is the warning that there is no greater danger to a democracy than a disillusioned people.

SMITH, V. R. Firm Foundations First. Canad. Pub. Health J. 34, 10:433 (Oct.), 1943.

Pleomorphic Rickettsiae—Twenty-four electron-micrographs of rickettsiae of epidemic typhus grown on chick-embryo constitute another step in our knowledge of these half-way organisms between bacterial and viral forms.

WEISS, L. J. Electron-micrographs of Rickettsiae of Typhus Fever. J. Immunol. 47, 5:353 (Nov.), 1943.

ASSOCIATION NEWS

Pan American Health Day Celebrated by the Committee on Professional Relations with Latin America

Commemorating Pan American Health Day, December 2, a "Health Charter for all the Americas" was dispatched to the capitals of all the American republics by the Association. Printed in English, Spanish, and Portuguese, and bearing the signature of Dr. Louis I. Dublin, Chairman of a newly appointed Committee to develop professional relations with Latin America, the Charter declared:

"We believe there are many ties that bind the Americas together beyond the accident of geography.

"High among these is the common purpose of the public health workers of all the Americas.

"United as we are in the timeless war against tyranny, so we unite now in the timeless war against disease, privation, and death.

"We unite to prevent the invasion of the Western Hemisphere by the plagues which ride behind the horsemen of war and famine.

"We unite to banish forever from our lands the diseases that have always been the heritage of mankind.

"We unite to fight malnutrition, ignorance, and all human misery.

"We unite in a scientific brotherhood of all the Americas to fight for that bright future possible only to happy, healthy peoples."

In a statement released to the Latin American press, Dr. Dublin stated that "the purpose of this committee is to encourage and develop in every practicable way cordial relations between workers in the field of public health in the United States and Canada and their colleagues in the Latin American countries. Especially at this time is it desirable to establish the closest ties of collaboration when the various countries of the North and South are engaged in a common effort to maintain the health standards of their people at high levels and to increase the common effort toward victory."



Dr. Ernest L. Stebbins, Health Commissioner of New York City (left) receiving a copy of the Health Charter from Dr. Dublin

Office of the Coördinator of Inter-American Affairs, 444 Madison Avenue, N.Y.C. 22

"The American Public Health Association," Dr. Dublin said, "has always been a clearing house for sound principles of health work. It has also served as a rallying point for closer personal relations within the profession. It hopes through its new committee to widen its sphere of influence to be equally useful in the Latin American countries. The committee proposes to explore the possibilities of an interchange not only of materials and information but also of professional workers to enable both parts of the hemisphere to share in the most recent public health practices and procedures."

"The Association through its Committee," Dr. Dublin declared, "dedicates itself toward these objectives and looks forward to increasing benefits to health work in both continents."

The members of the committee are:

Louis I. Dublin, Ph.D., *Chairman*, Third Vice-President and Statistician, Metropolitan Life Insurance Company, New York, N. Y.

Robert S. Breed, Ph.D., Chief, Division of Bacteriology, New York Agricultural Experiment Station, Geneva, N. Y.

Professor Gordon M. Fair, Professor of Sanitary Engineering, Harvard University, Cambridge, Mass.

Henry E. Meleney, M.D., Hermann M. Biggs Professor of Preventive Medicine, College of Medicine, New York University, New York, N. Y.

Nathan Sinai, Dr.P.H., Professor of Hygiene and Public Health, University of Michigan, Ann Arbor, Mich.

Ernest L. Stebbins, M.D., Commissioner of Health, New York, N. Y.

Clair E. Turner, Dr.P.H., Professor of Public Health, Massachusetts Institute of Technology, Cambridge, Mass.

The "Health Charter for all the Americas" was sent in duplicate with the request that the responsible health official in each country affix his signature to a copy and return it to the Association in New York as subscribing to its principles.

PROPOSED VITAL RECORDS ACT

The Executive Board of the American Public Health Association has approved the following resolution relative to the proposed Vital Records Act (S. 1096):

RESOLVED: That the Executive Board, on behalf of the American Public Health Association, hereby approves in principle U. S. Senate Bill 1096, subject to any improvement in the language which would clarify the purpose of the Bill and meet current objections, and which might be considered during the course of the forthcoming hearings.

APPLICANTS FOR MEMBERSHIP

The following individuals have applied for membership in the Association. They have requested affiliation with the sections indicated.

Health Officers Section

J. Shirley Hodges, M.D., 3800 University Park, Dallas, Tex., City of University Park Health Officer

Hernan San Martin-Ferrari, M.D., 615 N. Wolfe St., Baltimore, Md., Provincial Chief of Public Health Service of Antofagasta, Chile

Lester S. McLean, M.D., Vallejo Health Center, 228 Napa Rd., Vallejo, Calif., Director, Vallejo and Solano County Health Dept.

William A. Newton, M.D., 1149 Pearl St., Beaumont, Tex., Jefferson County Health Officer

Laboratory Section

Donald L. Augustine, Sc.D., Harvard Medical School, 25 Shattuck St., Boston, Mass., Assoc. Professor of Comparative Pathology and Tropical Medicine

Sgt. Beryl F. Capps, 37th General Hospital, APO 763, Postmaster, New York, N. Y., Bacteriologist

Gladys M. Craig, M.Sc., 170 East End Ave., New York, N. Y., Bacteriologist and Parasitologist, Doctors Hospital

Archibald M. Fitz-Randolph, 1618 A St., Portsmouth, Va., Asst. Sanitarian, U. S. Public Health Service

George E. Foley, 2 Primus Ave., Boston, Mass., Bacteriologist, House of Good Samaritan and Dept. of Preventive Medicine, Harvard Medical School

Frances J. Pain, 208 13th St., Pacific Grove, Calif., Junior Laboratory Asst., 9th S. C. Laboratory, Presidio of Monterey

Lt. Albert M. Reiss, Sn.C., Station Hospital, Mitchell Field, N. Y., Asst. Laboratory Chief and Asst. Base Sanitary Officer, U. S. Army

Lt. Joseph F. Ruiter, M.D.T.S., Lawson General Hospital, Atlanta, Ga., Instructor, Medical Dept., Technical School, Army of the U. S.

Major Leonard B. Solomon, M.C., 12th Hospital Center, Camp Gruber, Okla., Chief of Laboratory Service

Corp. Edward Stern, 967th Medical Hospital Ship Platoon, Camp Kilmer, N. J., Laboratory Technician

G. Fred Townsend, 905 W. Central Ave., Princeton, Ill., Asst. Chemist, Green River Ordnance Plant

Vital Statistics Section

Marian Champenois, 7325 St. Charles Ave., New Orleans, La., Tabulation Equipment Supervisor, U. S. Public Health Service

Andrew T. Court, 13–165 General Motors Bldg., Detroit, Mich., Employee Health Analyst, General Motors Corp.

Manuel F. Recao, Este 14, No. 12, Caracas, Venezuela, S. A.

Engineering Section

Jose F. Henrigues, Rua Otavio Correa, 95, Rio de Janeiro, Brazil, S. A., Engineer of Public Health, National Dept. of Public Health

Jose R. Leon, Williams 25, Santurce, Puerto Rico, Asst. Professor in Sanitary Engineering, School of Tropical Medicine

Abbot A. Sackheim, Room 720, Reisch Bldg., Springfield, Ill., Sanitary Engineer, State Dept. of Public Health

Industrial Hygiene Section

H. Irving Dunn, M.D., Station Hospital, Raritan Arsenal, Metuchen, N. J., Post Surgeon

Major Everett W. Probst, M.C., Picatinny Arsenal, Dover, N. J., Industrial Medical Officer and Surgeon, U. S. Army

Capt. Max N. Pusin, M.C., Co. "A", 91st Medical Gas Treatment Bn., Camp Livingston, La.

Jean E. Wolfson, M.D., 134 West 13th St., New York 11, N. Y., Health Officer in training, New York City Dept. of Health

Food and Nutrition Section

Louis C. Barail, M.D., D.D.S., 1415 Park Ave., U. S. Testing Co., Inc., Hoboken, N. J., Chief Bacteriologist

Dr. Emilio Messner, Rafael Pastoriza 1564, Montevideo, Uruguay, S. A.

Ruth C. Steinkamp, M.S., Vanderbilt University School of Medicine, Nashville 4, Tenn., Junior Nutrition Consultant, State Health Dept.

Maternal and Child Health Section

Eva F. Dodge, M.D., 501 Madison Ave., New York 22, N. Y., Obstetric Consultant and Assoc. Medical Director, Planned Parenthood Federation of America

Jerome L. Kohn, M.D., 50 West 96th St., New York 25, N. Y., Assoc. Pediatrician, Mt. Sinai Hospital

Public Health Education Section

Garnett M. Cooper, 247 Kimbrough St., Memphis, Tenn., Unit Supervisor, Tennessee Dept. of Public Welfare

Emily C. Keeffe, M.A., 1710 Prospect Ave., Cleveland, Ohio, Health Education Executive, Cleveland Y.W.C.A.

Lt. Col. Thomas T. Mackie, M.C., 6817 Georgia Ave., N.W., Washington, D. C., Exec. Officer, Tropical and Military Medicine, Army Medical School

Wade T. Searles, M.A., 82 N. High St., Columbus 15, Ohio, Field Representative, American Social Hygiene Assn.

Howard Strong, 1615 H. St., N.W., Chamber of Commerce of U. S., Washington 6, D. C., Special Representative, Health Advisory Council

Public Health Nursing Section

Martha P. Langley, 319 W. 8th St., Erie, Pa., Director, Visiting Nurse Assn.

Mrs Cora Hoop Liere, R.N., 1210 Sheridan Drive, Danville, Ill., Director of Nurses, Child Welfare Assn.

Guillermina Rivera-Valles, R.N., Catholic Univ. Sch. of Nursing Education, Washington, D. C., Student

Epidemiology Section

Edward L. Benjamin, M.D., 2021 Grand Concourse, New York, N. Y., Epidemiologist and Borough Chief, Bureau of Preventable Diseases, City Dept. of Health

Sally C. Preas, 279 W. 12th St., New York 14, N. Y., Research Assistant, Milbank Memorial Fund

School Health Section

Howard S. Hoyman, M.A., Univ. of Oregon, Eugene, Ore., Assoc. Professor of Physical Education

Unaffiliated

Sigmund L. Friedman, M.D., 3411 Steuben Ave., New York 67, N. Y., Asst. Director, Montefiore Hospital

Brig. Gen. Morrison C. Stayer, Panama Canal Health Dept., Balboa Heights, Canal Zone, Chief Health Officer and Surgeon, Caribbean Defense Command

DECEASED MEMBERS

Walter W. Council, M.D., Juneau, Alaska, Elected Member 1933, Health Officers Section

W. Brownley Foster, M.D., Richmond, Va., Elected Member 1908, Elected Fellow 1923, Health Officers Section

Robert W. Kehr, Seattle, Wash., Elected Member 1934, Engineering Section

John Harvey Kellogg, M.D., Battle Creek, Mich., Elected Member 1878, Food and Nutrition Section

James R. McEachern, M.D., Tampa, Fla., Elected Member 1932, Elected Fellow 1936, Health Officers Section

J. F. Nickerson, Chicago, Ill., Elected Member 1912, Food and Nutrition Section

EMPLOYMENT SERVICE

The Association Employment Service seeks to bring to the attention of appointing officers the names of qualified public health personnel and to act as a clearinghouse on employment. This is a service of the Association conducted without expense to the employer or employee.

From the registry of persons available, selected announcements are published from time to time. Appointing officers may obtain lists of all registrants on request.

Address all correspondence to the Employment Service, American Public Health Association, 1790 Broadway, New York 19, N. Y.

POSITIONS AVAILABLE

Physician: public health pediatrics. To assist director of maternal and child health in large California county health department. Major duties, conducting of infant and preschool health conferences and school examinations. Beginning salary $350 and travel allowance. California license required. Training and experience in pediatrics or public health or both. Immediately available. Address William C. Buss, M.D., Kern County Health Department, Bakersfield, Calif.

Wanted: A physician trained in tuberculosis to assume administrative control of the Bureau of Tuberculosis in an eastern city of 200,000 population. Salary $3,900–$4,500 plus cost of living adjustment. Address Box B, Employment Service, A.P.H.A.

Sanitarian wanted: Preferably with Bachelor's degree or engineering degree, plus public health experience or training. Must have own car. Applicant with lower qualifications will be offered an opportunity to take a short, free indoctrination course. Salary $1,920 per year with travel allowance of $50 per month, if qualified. Apply Dist. Dept. of Health, No. 6, Central Office, Newberry, Mich., Dr. Franklin.

Wanted: Pediatrician to supervise medical care of children at cerebral palsy center being established by private institution in coöperation with Illinois Division of Services for Crippled Children. Salary commensurate with experience and training. For further information write Lawrence J. Linck, Director, Division of Services for Crippled Children, 1105 So. Sixth St., Springfield, Ill.

The Department of Health, New Jersey, whose industrial health activities have expanded rapidly during the present war, has announced its need for two full-time industrial hygiene physicians for its Industrial Hygiene Service. As one of the leading states in the production of war materials, New Jersey offers unusual opportunities for gaining experience in occupational disease control besides giving the physician a chance to make a valuable contribution to the war effort. The principal duties of the selected physicians will be consultations in regard to the following: control of occupational diseases; industrial toxicological problems; evaluation of adequacy of plant medical services; promotion of measures which will reduce absenteeism from non-occupational causes; and conduct of industrial health education activities. Physicians interested in these positions should write to the Department of Health, Trenton, N. J.

Merit System for Personnel Administration in Delaware will set examinations for 3 positions in the Delaware State Board of Health shortly. The positions open for examination, together with the beginning salaries, are: Deputy State (County) Health Officer ($3,800), Pediatrician ($3,600), and Medical Social Consultant ($2,400).

These examinations will be unassembled, but successful candidates will be expected to appear in Delaware for an oral interview which will be a weighted part of the examination. Appointments may be expected soon after the examinations are conducted.

Information and specifications as prepared for each position may be secured by communication with the Merit System Supervisor, P. O. Box 1911, Wilmington, Del., and application for examination must be made on the official form.

The Milwaukee Health Department is interested in obtaining an instructor in hospital nursing to conduct a student educational program in its communicable disease hospital. Salary offered begins at $125 per month with maintenance, and increases of $5 per month each year until $135 has been reached. To this basic salary there has been added a cost of living bonus of $30.64 per month, making the total beginning salary $155.64 plus maintenance. Apply to Dr. G. F. Burgardt, Deputy Commissioner of Health, Milwaukee, Wis.

Wanted: Public health physicians in Texas. George W. Cox, M.D., State Health Officer, Austin, Tex.

Wanted: Public health statistician for large California County Health Department. College degree with training in statistics. Salary $200. Position open. Address William C. Buss, M.D., Kern County Health Dept., Bakersfield, Calif.

Hawaiian Territorial Board of Health seeks trained engineer to supervise rodent plague control program. Salary range from $331.67 to $398.33 per month subject to retirement deductions plus bonus. Position under Territorial civil service system with classification of P-4. For further details address A.P.H.A. Employment Service.

Wanted: Physical therapist by crippled Children's Division. Should be graduate of a school of nursing or of college, with a major in physical education or science; have completed a course in physical therapy; should have had experience in physical therapy, preferably with children. Write for application blank to Merit System Council, 416 Henry Building, 309 S.W. 4th Ave., Portland 4, Oregon.

Psychiatric case worker desired for mental hygiene clinic, Department of Health, Peoria, Ill.

Senior Sanitarian, Alaska Health Department. Minimum requirements 2 years college, 6 months public health course, 2 years' experience. Two additional years' experience acceptable instead of each year college. Monthly salary $235–$265. Mary B. Pool, Alaska Merit System, Juneau.

Michigan announces civil service positions now open for orthopedic public health nurse, Grades II and III classes with the Michigan Crippled Children's Commission. Salary range: Grade II $230 to $270 per month; Grade III $280 to $340 per month. Grade II not under 23, Grade III not under 25. Must have completed course in orthopedic nursing or physical therapy in approved school. For Grade III position a full-time course of at least 9 months' duration is required. Must have 3 years' experience in public health nursing, one year of which shall have been in supervisory capacity. For Grade III position one additional year of nursing and one additional year of supervisory experience required. Eligibility for certificate in public health nursing and registration as a nurse in Michigan. For further information write Michigan Civil Service Commission, 310 No. Grand Ave., Lansing 4, Mich.

Industrial Hygiene Toxicologist. Calls for person of chemical or chemical engineering background. Position, supervising of chemical work of industrial hygiene service and industrial hygiene laboratory; designing special apparatus for field studies on occupational disease problems; conducting field and laboratory analyses of toxicological exposures in industry; keeping records, interpreting results and preparing records. Requirements, knowledge of chemical laboratory methods and equipment; procedures for qualitative and quantitative analysis of organic and inorganic chemistry; knowledge of chemical methods of determining toxic materials in industry; familiarity with petrographic methods of mineralogical analysis. Immediate temporary appointment will be made, to be followed later by civil service examination to determine permanent status. Salary $2,900 base, plus $100 a year war adjustment, or total of $3,000 per year. Travel expenses also allowed. Must be U. S. citizen. Resident of any state may apply. Write J. Lynn Mahaffey, M.D., Director of Health, State Department of Health, Trenton 7, N. J.

Vacancies in the Illinois State Department of Public Health will be filled from the eligible registers resulting from Civil Service examinations now on call for Bacteriologist, Laboratory Technicians and Serologists. January 14 is the last day for the receipt of applications in the Illinois Civil Service office, Room 501, Armory, Springfield.

Salary ranges for these positions are—Bacteriologist I, $150–$190 per month; Bacteriologist II, $180–$225 per month; Bacteriologist III, $180–$225 per month; Bacteriologist IV, $300–$375 per month; Laboratory Helper, $100–$125 per month; Laboratory Technician I, $110–$140 per month; Laboratory Technician II, $130–$170 per month; Serologist I, $150–$190 per month; Serologist II, $180–$225 per month. Applicants must be legal residents of Illinois.

Persons now accepting employment in the Illinois State Service have the advantage of a "career service" system, whereby persons with the minimum of training and experience can enter the beginning positions and through service ratings and promotional examinations can advance to top positions in the field. An additional inducement to attract qualified employees is the newly enacted pension plan offering retirement and disability benefits to all state employees.

The examination will be given at various centers throughout the state immediately after the closing date, January 14.

Application blanks, position descrip-

tions and qualifications required can be obtained by writing to the Illinois State Civil Service Commission, Room 501, Armory, Springfield, Ill.

Wanted: Sanitary engineer or chemist to assist in stream pollution survey and later in study of sewage treatment. Should be qualified to perform chemical and bacteriological analyses of water and sewage and chemical analyses of industrial wastes. Nine months employment beginning as near January 1 as possible, with possibility of indefinite continuation, particularly if person is willing to do some other types of analytical work, including coal analysis. Salary $175–$250 per month depending on qualifications. Women considered. Address communications to Prof. Gilbert H. Dunstan, Dept. of Sanitary and Public Health Engineering, University of Alabama, Box 1996. University, Ala.

Wanted: Senior assistant serologists for immediate employment in New Mexico Public Health Laboratory, Albuquerque. Bachelor of Science degree and 1 year experience as serologic assistant in laboratory of recognized standing required. Starting salary $145 per month. Women or draft exempt men preferred. Address Dept. of Public Health, Box 711, Santa Fe, N. M.

Wanted: Public Health Nurse. Salary $175 per month and full maintenance, plus $25 per month for car expense. Must furnish own car. Write Paul D. Crimm, M.D., Director Boehne Tuberculosis Hospital, Evansville 12, Ind.

City of 70,000, southeastern U. S., seeks qualified health commissioner between the ages of 30 and 45, draft exempt. Salary $4,500 plus auto allowance of $300 per year. **Box V**, Employment Service, A.P.H.A.

FOR OTHER POSITIONS AVAILABLE WRITE EMPLOYMENT SERVICE, AMERICAN PUBLIC HEALTH ASSOCIATION, 1790 BROADWAY, NEW YORK 19, N. Y.

In view of the current active demand for trained and experienced persons in public health, it is suggested that prospective employers communicate directly with the Employment Service, American Public Health Association, 1790 Broadway, New York 19, N. Y., for up-to-date lists of applicants.

POSITIONS WANTED

Administrative

Physician, age 37, M.D. Iowa, Dr.P.H. Harvard, specializing in tuberculosis, seeks position as medical director of a sanatorium or a state bureau of tuberculosis. Exempt from military service. **A-476**

Physician, M.D. Yale, with private practice industrial medicine. Age 39 and draft exempt. Seeks opportunity as public health physician. **A-505**

Physician, age 28, M.D. Yale, trained in pediatrics, now county health officer of southern state, seeks administrative position in northeastern United States. **A-509**

Woman physician, age 35, M.D. University of Minnesota, 2 years' experience as county health officer, seeks clinical or administrative position, preferably South. **A-510**

Woman physician, well prepared in pediatrics. M.S.P.H. DeLamar Institute, Columbia University 1943, seeks employment in field of maternal and child health, preferably administrative in pediatrics. Excellent references. **A-507**

Physician, M.D. University of Arkansas, M.P.H. Harvard, experienced as county health officer. Age 35. Will consider position as county or city health officer or director of a bureau. **A-506**

Health Education

Woman with background of health education and public health nursing, experienced as teacher, supervisor, and writer, seeks teaching position of responsibility. **H-507**

Laboratory

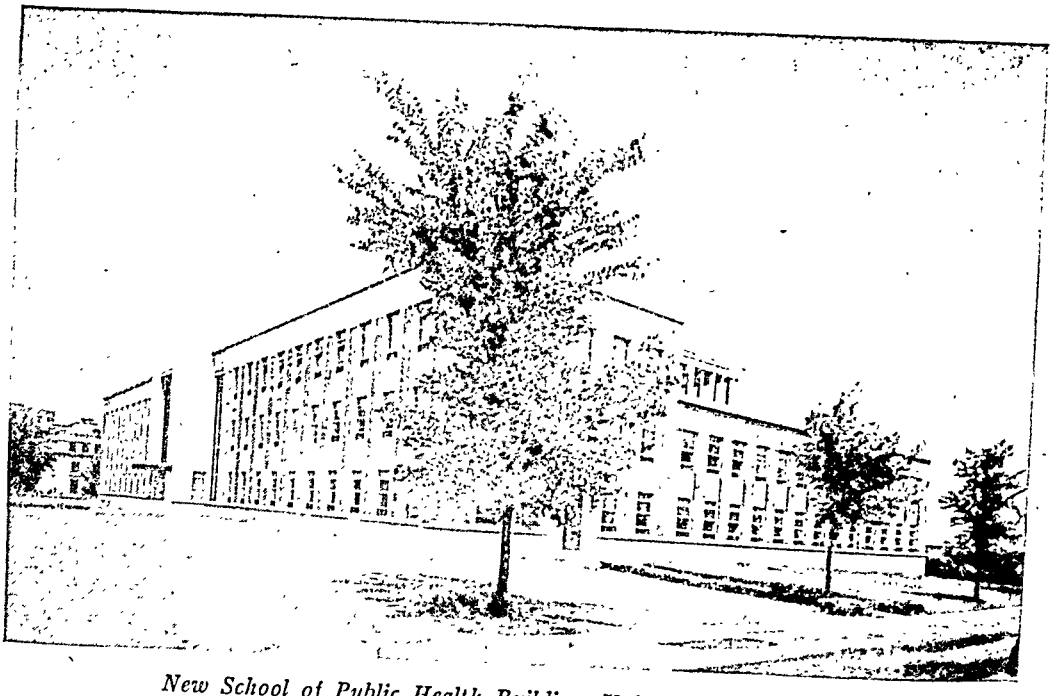
Research bacteriologist. Unusually trained and experienced woman bacteriologist and serologist now occupying responsible position in state laboratory seeks research work of permanent character. **L-468**

Water chemist, bacteriologist, M.S. degree in Sanitary Chemistry. Age 36, draft exempt. Eight years' experience in state laboratory working on water, milk and sewage. Prefers Midwest or Pacific Northwest location. **L-469**

Miscellaneous

Public Health Nurse. B.S. in nursing, William and Mary College, age 53, seeks position as coördinator of public health nursing, educational director, or director student nurse public health program. Preference as to location Middle Atlantic States. **M-452**

NEWS FROM THE FIELD



New School of Public Health Building, University of Michigan

University of Michigan School of Public Health

The new building housing the School of Public Health, University of Michigan, Ann Arbor, is now in use for students. The quarters assigned to the several departments were occupied during the late summer and early fall months. According to the Michigan Alumnus, this building was built and equipped at a cost of three-quarters of a million dollars as a gift to the University of Michigan from the W. K. Kellogg Foundation and the Rockefeller Foundation. An additional grant was made from the National Foundation for Infantile Paralysis in view of the large amount of work expected to be done by the school in the study of this disease.

The Regents of the University of Michigan created the School of Public Health in 1941 from the Division of Hygiene and Public Health which has been organized as such since 1921. Henry F. Vaughan, Dr.P.H., son of the late Dean Victor C. Vaughan of the Medical School, was named the first Dean of the new school. The faculty has been assembled from a nucleus of the teaching staff of the former Division.

"Research holds a coördinate position with teaching in the operation of Michigan's School of Public Health. This is revealed most persuasively in the floor plans. Whole wings are given over to the needs of the researchers and their staffs. The presence of animal rooms reveals to the visitor forcibly that in this building scientists are studying and experimenting."

Among the features of the school are continuation study courses, including a plan for continued education through

short courses for individuals employed in public health services, physicians and dentists in private practice, and other professional groups with a major interest in health science services. Courses are also offered to milk plant operators, hotel and restaurant managers concerned with food handling, well drillers, plumbers, and the various occupations connected with industrial activity. Other courses are provided for public officials whose responsibilities involve health problems, such as county supervisors, health board members, school officials, public works and service officials, probate judges, etc. A recent course included study in industrial hygiene for plant safety personnel.

A feature of the fall program included a 4 day conference of teachers of public health from all parts of North and South America which was called for the purpose of working out exchange relationships between the countries and between universities specializing in this field.

SUPPLY OF PENICILLIN

Because of numerous requests received by the Army for penicillin, Surgeon General Normal T. Kirk of the Army Medical Department has explained that the War Department " at no time has either controlled penicillin or received the entire output." The Army's position with regard to penicillin supply is exactly the same as that of the Navy, U. S. Public Health Service, and the Office of Scientific Research and Development, each of which receives a monthly allocation of penicillin from the War Production Board. General Kirk also explained that the penicillin allocated to the Army Medical Department is intended for the treatment of military personnel and " none of it can be reallocated or released to civilians."

Penicillin is a new drug which is being tried out in Army, Navy, and civilian hospitals in the treatment of serious types of infections which will not respond to sulfa drugs. The supply of penicillin is limited and distribution is controlled by WPB. This month, according to WPB, the Army will receive 56 per cent of the total supply, the Navy 18 per cent, U. S. Public Health Service (for the treatment of Coast Guard and Merchant Marine personnel) 2 per cent, the Office of Scientific Research (for civilians) approximately 15 per cent, and the remainder to the scientific staffs of drug companies for their own research.

Though production of the drug is steadily increasing, at present none of the agencies, including the military, receives as much as it needs. Its distribution among military and naval personnel is determined by the Army, Navy, and the U. S. Public Health Service. Distribution of the part allocated to civilians is for clinical research and its assignment is determined by a committee headed by Dr. Chester S. Keefer, Evans Memorial Hospital, Boston. Since the amount of penicillin requested by civilians greatly exceeds the available supply, it has been determined by the Office of Scientific Research and Development that civilian requests must be made through their doctors who should communicate with Dr. Keefer by telephone, telegram, or personal letter giving complete details of the case so that he may have an adequate basis for his decision.

NATIONAL SOCIAL HYGIENE DAY, FEBRUARY 2, 1944

The American Social Hygiene Association, New York, N. Y., has announced that it will again sponsor National Social Hygiene Day as an occasion in many communities for intensifying the year-round campaign against venereal diseases and conditions favorable to their spread. Dr. Walter C. Clarke, Executive Director of the As-

sociation, has announced that united community action against venereal disease is the theme of the plans made for February 2. Interested individuals and groups may obtain full details by writing to the American Social Hygiene Association, 1790 Broadway, New York 19, N. Y.

PUBLIC HEALTH FEATURES OF THE UNITED NATIONS RELIEF AND REHABILITATION ADMINISTRATION

The public press has carried recently extensive accounts of the meetings of the Council of the United Nations Relief and Rehabilitation Administration in Washington and Atlantic City. A summary of some of the features especially relating to health is presented herewith. The *Journal* is grateful to Selskar M. Gunn who was in attendance at the sessions of the Council and who has indicated the areas of special interest to health workers.

The Sub-Committee on Policies with Respect to Medical Care has been under the chairmanship of Thomas Parran, M.D., Surgeon General of the U. S. Public Health Service. This subcommittee belongs to Committee IV, the Committee on Relief and Rehabilitation Policies, of which the Chairman is Dr. Tingfu F. Tsiang of China.

The terms of reference of this committee are set forth in the UNRRA agreement as follows:

". . . that immediately upon the liberation of any area by the armed forces of the United Nations or as a consequence of the retreat of the enemy, the population thereof shall receive aid and relief from their sufferings, food, clothing and shelter, aid in the prevention of pestilence and in the recovery of the health of the people, and that preparation and arrangements shall be made for the return of prisoners and exiles to their homes and for assistance in the resumption of urgently needed agricultural and industrial production and the restoration of essential services."

The significant features of the approved resolution relating to health and medical care include the following:

1. A recommendation that governments provide for the notification of diseases likely to become epidemic and for uniformity in quarantine regulations and other measures of prevention.

2. It is recommended that governments, when requested by the UNRRA administration, offer facilities in making available suitable personnel for a health organization, including the temporary loan of technical experts and the services of scientific institutions.

3. It is recommended that there be the closest collaboration between the UNRRA administration and the Allied military authorities with reference to the notification of infectious diseases and to the orderly transfer to the administration of epidemic control and other public health measures put into operation by the military authorities.

4. It is recommended that governments, when requested by the UNRRA administration, facilitate in every way the assignment of their nationals from the occupied countries for technical training, especially in the newer aspects of medical and sanitary sciences.

Scope of the Health Work of UNRRA

1. Health work will necessarily constitute one of the primary and fundamental responsibilities of UNRRA.

2. This program is to consist chiefly of the provision of assistance to governments in the rapid reëstablishment of their health services generally, preventive and curative. These services include not only disease control and relief from malnutrition but the reestablishment of medical services, hospitals, dispensaries, sanatoria, health centers, laboratories, environmental sanitation, maternity and child welfare services, control of endemic diseases, particularly tuberculosis and venereal diseases, and other essentials for health. UNRRA should be prepared to give assistance with equipment and supplies, personnel, expert advice, facilities for technical training and the collection and dissemination of information bearing on the above problems.

3. One of the aims of UNRRA should be to equalize opportunity for the restoration of health in the various countries. This will involve a sharing of responsibilities and equitable distribution of goods and other assistance in proportion to need and in accordance with a coördinated plan.

4. In view of the obvious importance of dealing rapidly with epidemics, it is essential

that the health organization have at its immediate disposal trained personnel and material.

5. The health organization may be called upon to provide for the loan of experts to various countries, particularly in cases where diseases have been introduced for the first time as a result of the war and with the control of which neither the national health authority nor the local practitioners are familiar.

6. The medical aspects of nutrition will constitute one of the chief preoccupations of the health organization which will be urgently concerned with the provision of nutritional standards adequate for the maintenance of health in the territories in which it operates.

7. The health organization will play an extremely important part in the health supervision and control of returning displaced persons.

8. The special health needs of children and expectant and nursing mothers must be given early recognition by the health organization. The health organization may also be called upon to assist in dealing with the conditions of anxiety, fear and emotional disturbance which will have arisen in peculiarly great frequency among the children and youths of occupied territory.

9. A constant objective of the health program should be to demonstrate the effectiveness and need of international collaboration in public health. In so doing it will facilitate the later development of a permanent world-wide health organization.

10. Whenever possible the national and local health services should be the channels through which the health work of relief and rehabilitation operations are carried out and it should be a constant objective to assist in strengthening these services.

11. A special section in the health organization for epidemiological control is suggested in order to promote collaboration between member governments in the control of epidemic diseases.

12. Coöperation with existing governmental health agencies should be fostered.

13. The wide experience and good will of the non-governmental health agencies should be utilized to the utmost as it is clear that the full participation of all such agencies may well be needed. In accordance with the terms of the agreement, plans and policies should be developed whereby the resources of such organizations may be used effectively in those health aspects of relief and rehabilitation to which they have special relationship.

14. The reëstablishment of health being one of the principal objects of relief work, it is essential that the status of the health organization should be commensurate with its importance in the work of the whole administration. It is a recognized principle of administration that all work of a technical character be carried out under technical direction. In view of the fact that almost every aspect of the work of UNRRA will necessarily have health implications (programming, supplies, personnel, training, coöperation with governments, field operations, etc.), the director of health must be afforded a position in the administration which will enable him under the authority of the Director General to develop suitable policies and to exercise proper technical direction over all health aspects of the work of UNRRA.

15. The health organization should consist of a director of health and a technical and administrative staff, a standing technical committee on health which would be advisory to the Council, to the Central Committee, and to the Medical Director, and the necessary regional organization. Experience has shown that a considerable degree of decentralization is desirable in health administration, so that strong regional organizations will be needed in areas such as Europe and the Far East.

16. The director of health should be accorded a position in the administration which will enable him under the authority of the Director General to direct suitable policies and to exercise proper technical direction over all health aspects of UNRRA. He will be directly concerned in all major policy and administrative decisions in which health, medical or nutrition problems are involved. It follows that the status and success of UNRRA from the health point of view depend upon obtaining the services of a director of health of the highest possible professional standing, whose previous work is such as to command the respect of those qualified to judge, both from a technical and administrative point of view. A regional health director should be appointed to each regional organization with a position relatively similar to that provided for the director of health.

17. The greatest care will be required in selecting health personnel for field work in the various countries. Technical competence is fundamental, but almost equally important is the ability to work in a team with others of different nationality, as the staff will necessarily include health personnel from a number of countries. This qualification is of primary importance for members of the staff required to work away from headquarters, for they must be able to understand the out-

look of the people among whom they are called upon to work. In comparison with this qualification, a knowledge of languages, though a valuable assets, is of secondary importance.

18. It is impossible to anticipate what types of individual or special missions may be required. Requests may come for highly technical assistance in almost any branch of medical or sanitary science, particularly in view of the isolation of many of the experts of these nations during the years of war. UNRRA should collect information regarding individual experts and expert teams which might be made available for service in the field should the occasion arise.

19. A standing technical committee on health should be appointed, as provided for in the agreement. The members should be limited to between 9 and 15. It is urged that members of the committee should have as alternates persons technically capable of aiding in the delibrations of the committee.

20. In view of the highly technical character of the health work of UNRRA it will be essential to have authority to appoint expert commissions. The members of these commissions should be nominated as individuals solely on the ground of their special knowledge of the subject concerned. As members of expert commissions speak as individuals only, there is no necessity to make any such commission even approximately representative of a number of countries.

21. Expert commissions on nutrition will be required in view of the wide differences obtaining in the food habits and nutritional status between various parts of the world. The director of health should be able to summon either centrally or regionally conferences of directors of national public health services whenever practicable and desirable.

22. Among the tasks calling for immediate action is the obtaining of medical literature dealing with the progress of medicine and hygiene during the years of war for the liberated countries.

23. Even though it may not be possible for UNRRA to meet all the relief and rehabilitation needs of the populations affected by the war, nevertheless by approaching the tasks through the wise use of the technical resources of the United Nations, mobilized and engaged in the same spirit of coöperation as they are now devoting to the prosecution of the war, it should be possible, in the public health sphere, to attain comparable success in the war against disease and for the restoration of health.

The personnel of the Sub-Committee on Policy with Respect to Health and Medical Care at the time of the conference was as follows: *Chairman,* Thomas Parran, M.D., United States; Mr. Sitsen, Netherlands, alternates Dr. W. M. Bonne and Dr. J. A. F. van den Belt; Dr. Galtung Hansen, Norway, alternate Dr. Nicolaysen; Ricardo A. Morales, Panama, alternate Narciso E. Garay; Dr. Celso R. Velazquez, Paraguay, alternate Dr. Paris E. Menendez; Juan Chayez, Peru, alternate Julio Balbuena; J. M. Elizalde, Philippines, alternate Dr. A. B. Rotor; Prof. B. Nowakowski, Poland, alternates Dr. Artur Lejwa and Dr. Alexander Rytel; A. T. Brennan, Union of South Africa, alternate R. Webster; Dr. V. Lebedenko, Union of Soviet Socialist Republics; Dr. Melville Mackenzie, United Kingdom; Dr. Leo Rabinovitch, Yugoslavia, alternate George Radin. Representing the Director General, Frank G. Boudreau, M.D., alternate Selskar M. Gunn.

LABORATORY EQUIPMENT CONTROL EASED

Control over the distribution of laboratory equipment has been eased by WPB through issuance of Order L-144 as amended. Authorization of purchase orders for the following items, designated "List A," is still mandatory, except in the case of distributors' purchase orders; Analytical balances (sensitivity 1/5 mg. or more sensitive); Calorimeters; Centrifuges; Hydrogen ion meters (electrometric); Metalloscopes; Microscopes (except Brinnel and Tool Makers); Microtomes; Potentiometers, Wheatstone Bridges and Resistance Boxes; Refractometers; Spectrographs, spectroscopes, spectrometers and spectrophotometers; Vacuum pumps (1 micron or higher vacuum).

No authorization is now required for items not on list A, as the amended order removes former additional restrictions on deliveries. These prohibited the filling of purchase orders for items

having a value of $50 or more, for quantities of the same item aggregating $50 or more, or for quantities of items aggregating $200 or more, except upon specific WPB authorization, or for delivery to the Army or Navy, serial-numbered laboratories, and distributors.

The amended order also:

1. Puts distributors located in Canada on the same basis as those located in the United States, its territories and possessions.
2. Revises List A by removing several items formerly included and by using specific names of instruments in all cases.
3. Makes clear that List A does not include secondhand equipment or parts for maintenance and repair of existing equipment, and that the list applies only to items designed primarily for use in laboratories.

SEATTLE PLANS POST-WAR HEALTH BUILDING

Ragnar T. Westman, M.D., Acting Commissioner of Health of Seattle, Wash., has announced that the city is making post-war building plans for the erection of a new public health building to house all divisions of the Department of Health and Sanitation and that it is first on the list of proposals.

Dr. Westman would be glad to correspond with health officers of other cities who are making similar plans for the post-war period.

UNIFORM ACT ON PUBLIC HEALTH UNITS

The Conference of Commissioners on Uniform State Laws has authorized the Chairman of its Public Law Acts Section to draft a uniform act on Public Health Units for the guidance of state legislatures drafting public health legislation. At the present time many states do not have legislation permitting, and indeed some have legislation prohibiting, city-county or multi-county full-time local health units. The model law being drafted by the Conference will be designed to facilitate state action on a substantially uniform basis in organizing units of local health service suitable in size, area, and other characteristics both to justify and support an adequate and well rounded professional supervisory and field staff. The Conference, in drafting this law, is acting upon the request of the APHA Subcommittee on Local Health Units. The Chairman of the Public Law Acts Section who is drafting this legislation is Robert K. Bell, an attorney of Ocean City, N. J.

AMERICAN SOCIETY FOR THE CONTROL OF CANCER APPOINTS EXECUTIVE

J. Louis Neff of East Williston, Long Island, N. Y., has been appointed Executive Director of the American Society for the Control of Cancer, New York, effective January 1. Since 1923 Mr. Neff has been Executive Secretary of the Nassau County, N. Y., Medical Society and Secretary of the Nassau County Cancer Committee since 1928. Mr. Neff is a member of the Section Council of the Public Health Education Section, and a Fellow of the A.P.H.A.

MICHIGAN PUBLIC HEALTH ASSOCIATION ELECTS OFFICERS

At the Annual Business Meeting of the Michigan Public Health Association held in Grand Rapids on November 4, the following officers were elected:

President—John M. Hepler, C.E., Lansing
President-Elect—Nathan Sinai, Dr.P.H., Ann Arbor
Vice-President—Hugh Robins, M.D., Marshall
Secy. Treasurer—Marjorie Delavan, Lansing
Representative on Governing Council of A.P.H.A.—Emilie G. Sargent, R.N., Detroit
Directors—Joseph G. Molner, M.D., Detroit, 1946 (At Large); Percy M. Phelps, Grand Rapids, 1946 (Representing the Michigan Association of Sanitarians)

This was the 23rd Annual Public Health Conference held by the Michigan Public Health Association and 605 persons were registered from all sections of the state. The emphasis was on group discussion of urgent problems. A half-day meeting of the Michi-

gan School Health Association followed the adjournment of the public health conference.

PAN AMERICAN HEALTH DAY ESSAY CONTEST

Dr. Hugh S. Cumming, the Director of the Pan American Sanitary Bureau, Washington, has recently announced, in connection with Pan American Health Day, that there would be held an essay contest for high school students to encourage thought about the value of health and of international coöperation in health matters. The prizes, offered by the Lily Tulip Cup Corporation, will consist of $75, $50, and $25 War Bonds. The theme of the essay is to be " What My Country Has Contributed to International Health Coöperation or Knowledge in the Field of Water, Food and Beverage Sanitation." The essays, which are limited to 2,000 words, must be received by the Pan American Sanitary Bureau not later than May 31, 1944, and the contest is open to students in the 11th and 12th grades of high school. Further information can be obtained from the Pan American Sanitary Bureau, Washington 6, D. C.

CENTER FOR THE DEVELOPMENT OF PHYSICAL MEDICINE

The National Foundation for Infantile Paralysis, Inc., has announced a grant to the Graduate School of Medicine of the University of Pennsylvania, Philadelphia, totaling $150,000 for a 5 year period for the establishment of what is said to be " the first center for the scientific study and development of physical medicine as a branch of medical practice."

According to Basil O'Connor, President of the Foundation, this represents a continuation of the interest which the Foundation has had in the part which physical medicine can play in the treatment of infantile paralysis. More than $350,000 has been spent during the past 6 years to educate and train physical therapy technicians. An additional $364,000 has been granted for the study of problems in physiology and medicine bearing on physical therapy. The Departments of Anatomy, Physiology, Pathology, and other basic sciences of the University of Pennsylvania will coöperate in this program which will be under the general direction of Dr. Robin C. Buerki, Dean of the Graduate School of Medicine.

SOUTH CAROLINA PUBLIC HEALTH ASSOCIATION

At a recent meeting, the South Carolina Public Health Association elected the following officers to serve for the coming year:

President—G. S. T. Peeples, M.D., Columbia
1st Vice-President—Lavinia Baskin, R.N., Moncks Corner
2nd Vice-President—C. G. Leonard, Spartanburg
Secretary-Treasurer—Mrs. Frank George, R.N.. Columbia

DR. J. H. KELLOGG DIES, A.P.H.A.'S OLDEST MEMBER

John Harvey Kellogg, M.D., of Battle Creek, Mich., died on December 14 after a brief illness, at the age of 91. For many years Dr. Kellogg was Director of the Battle Creek Sanitarium where he developed many routines for what he called " biologic living."

Dr. Kellogg joined the American Public Health Association in 1878 and recently completed 65 years of continuous membership, the longest on record. He is believed also to have been the oldest member of the Association. A certificate for long membership in the American Public Health Association was given to Dr. Kellogg in 1936 when the Association met in New Orleans.

Active up to the last, Dr. Kellogg maintained his interest in diet and in efforts to avoid what he believed to be a serious racial deterioration as the result of unhygienic living.

TEXAS WATER WORKS AND SEWERAGE SHORT SCHOOL

The 26th Annual Texas Water Works and Sewerage Short School will be held at Texas A. & M. College, College Station, Tex., January 31–February 2.

The three full days will be devoted to discussions on such important topics as recent developments in priorities, the function of the Office of War Utilities, use of idle equipment, man power problems, post-war planning, the U. S. Public Health Service Standards for drinking water, water supply security, in-service training of water and sewage plant operators, the latest developments in the relation of poliomyelitis transmission and sewage, as well as the relation of Army and Navy standards to the operation of municipal utilities, and new developments in the various fields.

KANSAS CITY-WYANDOTTE COUNTY PROGRAM

Wyandotte County recently consolidated with the City of Kansas City, Kan., in a joint health program under the Direction of William H. Pickett, M.D., Surg. (R), U. S. Public Health Service. The consolidated health unit also has a Health Center building now housing the entire department. The Health Center was provided through a Lanham Act project under the Federal Works Agency. Building and remodeling, as well as much new equipment, were provided by the project.

PERSONALS

Central States

ERNEST J. BECKNER, M.D.,† of Pratt, Kans., has been appointed Health Officer of Butler County, succeeding SAMUEL N. MALLISON, M.D.†

VERNON P. CROCKETT, Assistant Engineer, U. S. Public Health Service (R), has been assigned to the Kansas City (Kan.)-Wyandotte County Health Department to have charge of Public Health Engineering.

LUNSFORD D. FRICKS, M.D., D.P.H.,* has resigned as Health Officer of Helena and Lewis and Clark County, Mont., because of poor health. His resignation was effective August 31.

E. K. MUSSON, M.D., M.P.H.,* is on leave from his position as Chief Medical Officer of the Chicago Health Department, Chicago, Ill., and has been commissioned Senior Surgeon in the U. S. Public Health Service Reserve and assigned to the Chief Medical Officer, Office of Foreign Relief and Rehabilitation Operations. Dr. Musson has been ordered to the School of Military Government, Charlottesville, Va., for three months' training, after which he presumably will be assigned abroad.

Eastern States

LEON A. BEARDSLEY, M.D., of Ithaca, N. Y., has been appointed Health Officer of Caldwell, Lyon and Crittenden Counties, Ky., effective August 24.

LEVERETT D. BRISTOL, M.D., DR.P.H.,* formerly Health Director of the American Telephone and Telegraph Company, New York, N. Y., has been appointed Executive Director of the Hospital Council of Greater New York.

LT. BERNARD D. DAITZ, SN.C., A.U.S.,† is now serving with the Allied Commission, formerly AMGOT. His address is 2675 Regiment, A.P.O. 512, New York, N. Y.

MAJOR GENERAL JAMES CARRE MAGEE, Medical Corps, United States Army, retired, has been named Executive Officer of the information service of the Division of Medical Sciences of the National Research Council. This service has been established by the

* Fellow A.P.H.A.
† Member A.P.H.A.

Council under the recent grant of the Johnson & Johnson Research Foundation of New Brunswick, N. J.

MARION I. MURPHY, R.N., who for several years has been Director of Nursing in the Cattaraugus County Department of Health, Olean, N. Y., resigned, effective November 25, to accept a position as Assistant Director in the Bureau of Public Health Nursing in the Michigan State Department of Health, Lansing.

MARGUERITE PRINDIVILLE, R.N., who has been Director of the Eastchester Public Health Nursing Organization, Tuckahoe, N. Y., has resigned to accept the position as Director of the Seattle Visiting Nurse Service, Seattle, Wash. Miss Prindiville will participate in an amalgamated program with the Seattle Department of Health and Sanitation. It is expected that she will later become Director of the new Division of Public Health Nursing in the Department of Health.

Southern States

GUY B. ANDERSON, M.D.,† of Ellicott City, Md., has resigned as Health Officer of Howard County.

EDWARD M. BARNES, M.D., formerly of Tampa, Fla., is the Director of Health of the new Health Department established in Galveston County, with headquarters in LaMarque, Tex.

E. R. COFFEY, M.D.,* of the staff of the U. S. Public Health Service, who for some years has served as Assistant Surgeon General in charge of the Division of Sanitary Reports and Statistics, Washington, has been appointed Director of District No. 1 for the Service with headquarters in New York. Dr. Coffey was formerly State Health Officer of Washington.

NAOMI DEUTSCH, R.N.,* formerly in charge of the Nursing Service of the U. S. Children's Bureau, has arrived in Managua, Nicaragua, to give a series of lectures and demonstrations in connection with poliomyelitis, according to the press on December 1.

CHARLES C. HEDGES, M.D.,* who since May 1, 1939, has been Health Officer of Savannah and Chatham County, Ga., has resigned to become Medical Director of the Vallejo Community Hospital, Vallejo, Calif. Dr. Hedges has been succeeded by CLAIR A. HENDERSON, M.D., who has been Commissioner of Health of Augusta, Ga., and Richmond County.

ELLSWORTH H. JOHN, M.D., of Brownsville, Ky., has been appointed in charge of tri-county health unit of Meade, Breckinridge and Hancock Counties, with offices in Hardinsburg.

HENRY R. O'BRIEN, M.D., M.P.H.,* is on active duty as Senior Surgeon (R) in the U. S. Public Health Service, assigned to the Office of Foreign Relief and Rehabilitation Operations, and detailed to the School of Military Government at Charlottesville, Va. Dr. O'Brien has resigned as chief of the Division of Local Health Administration in the Connecticut State Department of Health, Hartford.

Western States

BEVERLY C. BOOTH † has resigned as Sanitarian in the El Paso County Health Unit, Colorado Springs, Colo., and has accepted a position as Public Health Engineer in the Division of Sanitary Engineering, South Dakota State Board of Health, Pierre. GLEN J. HOPKINS † is the Director of the Division.

FRED T. FOARD, M.D.,* Surgeon, U. S. Public Health Service, has been

* Fellow A P H A
† Member A P H A

American Journal of Public Health
and THE NATION'S HEALTH

Volume 34 February, 1944 Number 2

Health IS Social Security*

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Secretary, State Charities Aid Association, New York, N. Y.

AS each of us develops from the complete dependency of infancy to the independence of adult years, we gradually acquire an earning capacity, and we likewise acquire continuing responsibilities—to support ourselves, to support or care for a family, to be useful citizens, good members of a community. These two factors of income and of obligation are not tied together chronologically. The income may diminish, or disappear, but the obligations continue.

Social security, in a broad sense, is an effort to tie together chronologically the factors of income and of obligations; so that if income is cut down or disappears, by reason of illness, accident, death, or unemployment, the obligations can still be met. That this is a desirable objective, both from point of view of the individual and of the community, is obvious. The question is by what methods it can be most successfully attained. Few of us, if any, reach the later years of adult life without facing, at least once, and for some of us repeatedly, the possibility of greatly reduced income, without reduced obligations. Social security, in that sense, is for each of us a matter of personal interest. But how can it be attained?

There are many kinds of interference with income. Obviously, we must consider each such cause separately. The simplest approach to security, or at least the approach which is now under widespread consideration, is that of replacing the normal income during its diminution or absence, by payments from a fund which has been accumulated piecemeal by small weekly payments by all potential recipients and by their employers. This is a form of social security; and, in essence, it is social insurance. However, another possibility demands prior consideration as being inherently more desirable, when practicable; the alternative of preventing the interference with income. It scarcely requires argument that prevention is better than cure, cheaper, tremendously more acceptable.

Under reasonably normal conditions, i.e., in the absence of a depression and, therefore, in the absence of widespread unemployment, the major interferences with income arise from illness and premature death. Can illness be pre-

* Presented at a Special Session of the American Public Health Association at the Seventy-second Annual Meeting in New York, N. Y., October 12, 1943.

vented? Can premature death be prevented? To ask these questions at such a meeting as this is carrying a large supply of coal to Newcastle. Through the efforts of the authorities, agencies, and individuals in attendance or represented here, untold hundreds of thousands of illnesses have been prevented, and untold thousands of premature deaths have been averted. It is as simple as addition or multiplication that these public health authorities, by preventing illness, have prevented interference with income in hundreds of thousands of cases. In this fashion, public health has been, during the past hundred years, a dynamic factor in the conservation of family income, and thus has made an enormous contribution to social security. In fact, health, a necessary condition of earning, is, *ipso facto,* a form of social security.

Furthermore, it is social security of the most acceptable and useful type. The continuing receipt of income, after all, is not the only factor in social security. The situation of a wife whose husband is living, active, earning, and meeting his family responsibilities, is tremendously different from that of a widow who receives a check once a month—much less than her husband formerly earned—from an old age and survivors insurance fund, but at whose table, three times a day, the place of the head of the family is vacant. That difference is precisely the measure of the difference between security arising from public health (when that is possible) and security arising from social insurance.

We need now to ask several questions as to public health social security. How large a factor has it been up to now? Has it been as large a factor as it should have been? If not, what has interfered with its desirable growth? How can we remove those interferences from now on? By what major channels can public health security attain its maximum effectiveness, and thereby reduce the volume of need for social insurance security?

This audience, more than any other group, can quickly recall the tremendous decrease in the volume of sickness and death brought about, in some instances wholly, in other instances largely, and in still other instances in lesser degree, by public health agencies and practices. How different would be the circumstances of our lives had there been no vaccination against smallpox, no effective prevention of typhoid fever, if yellow fever were as frequent in this country as it was a century ago; if tuberculosis were at its volume of even forty years ago; if there had been no preventive campaign against diphtheria; if the dangers of childbirth had not been diminished to such a substantial degree during the past decade. We need not bring into action the processes of statistical calculation to realize that through such efforts the incomes of countless individuals have been preserved, and the lives of fathers and mothers conserved for their families, to an extent which, in its full volume and significance, may be beyond the imagination even of the group here present.

Although public health has done much, we must ask ourselves, could it have done more? Could we have prevented more speedily and more generally the diseases just mentioned and others, as to which scientific preventive procedures have become practicable? We must admit, of course, that though we have labored diligently, we have accomplished only a minor fraction of what it has been scientifically possible to accomplish. There has continued to be a great volume of poverty, distress, breaking up of families, because of illnesses and deaths, which it was scientifically possible to prevent. What are some of the reasons why our success has been only partial? We probably would not have many differences of

opinion on this subject. I would recall them in about the following terms:

1. We have not, as a rule, presented our opportunities for disease prevention to the public and to the various governmental units with much imagination or with much confidence or courage. We have been troubled by our inability to guarantee one hundred per cent return on the money we asked for. We have been embarrassed because we could not always "prove" in advance just what we could accomplish. We have therefore understated our case.

2. As a result, we have received even smaller grants of funds from fiscal authorities than we asked for. Our plans, already much too limited when proposed by us, have been greatly reduced, and the specific grants have been inadequate for the purposes for which they were made.

3. We have accepted these limitations too readily, without continuing protests and promotional efforts aimed to inform the entire community. We have become almost contented far too easily with doing small things or minor fractions of several things without keeping in mind our total opportunities.

4. As a result, we have not even planned total war against preventable diseases. We have planned the initial approaches, the early stages, an experiment or a demonstration, but have not followed up the experiment or the demonstration as to its possibilities as applied to the total need.

5. Health activities have been much too localized in small units of government, towns, and villages, with small resources and with no qualified or trained personnel. If you will read, *England's Road to Social Security, 1349–1942,* you will be impressed, as reviewers of the book have been, with the fact that for this 600 years the trend has been steadily away from "localism" toward larger and larger governmental units of administration and of finance, until a large part of these welfare operations is now on a nationally administered and nationally supported basis. During a much shorter time, and as yet to a minor degree, this trend is plainly visible in public health administration in this country. It is to my mind an inherent trend in any sound and effective development of public health, but it does not follow by any means that we will go the whole distance toward national operation or national support. We are very far from having achieved, as yet, that balance between local, state, and federal participation in finance and in administration which will secure for each person in the country even a reasonable degree of health protection, and therefore of health social security.

6. Partisan politics, especially in small units of government, have often paralyzed the activities of health authorities, or have prevented the utilization of men who have even a slight understanding of public health possibilities.

7. It must be put into the record, too, because it is a fact, regrettable though it is, that medical organizations, local, state, and federal, often with only a slight understanding of public health problems, have been bewildered and alarmed by governmental action in public health; have opposed plans that were not microscopic in volume; and have tried to insist upon administration by the small governmental units, which were more likely to be subject to their influence. This is not always the case, but it is the general picture.

This enumeration of some of the factors which have restrained the public health movement from accomplishing more nearly that great volume of health security for which there was adequate scientific basis, must not lead us to underestimate the striking results that have been achieved, nor above all to fail to make more adequate plans for

the future. The quickest way to conserve individual incomes and family resources, is by more and more and better and better public health. We may well consider for a few moments some of the steps which would help in achieving that larger development of public health which is easily within our grasp financially and administratively, and the failure to achieve which is a standing reproach to us as communities, states, and as a nation. Here are some of the things which it seems to me we must do. To a degree they are simply the reverse of the factors mentioned a few minutes ago as having restrained us heretofore.

1. Once and for all we must recover from the fallacy of picayune plans. We must no longer be afraid of adequate plans, plans which are as big as the evils which they aim to control. As a matter of fact, it is often easier to secure the adoption of a big plan than of a little one. A little plan, offered in face of a big need, suggests little officials to whom fiscal authorities do not need to pay much attention. We Americans are convinced that we are the most resourceful, energetic, dynamic, competent people now existing. I judge that we are; but this is not true as to our public health progress. Why should we be relatively (as compared with other functions) a backward people in this most strategic of social opportunities?

2. To make good in a big way in our plans for the prevention of disease and the postponement of death, we must keep the preventive objective clearly in mind; as Willkie said to Stalin, "We must keep our eye on the ball." Until we have gotten much farther along toward the complete control of tuberculosis, syphilis, gonorrhea, and other communicable and preventable diseases, we cannot, as health authorities, seek or take on the tremendous task of securing good medical care of all sorts for everybody. That may come unsought, in some degree, in time, probably piecemeal, but we certainly are not ready for it now. Our health agencies have already hoisted their flags over large fields, some of which (possibly most of which) they occupy so thinly as to be most ineffective. To spread out over still wider areas, would mean being even less effective than we are now in many of our preventive efforts.

3. The antidote for partisan politics is *non-partisan* politics, i.e., to present an alluring program in simple words, to arouse public interest and wide public support for it, and thus to create a healthy climate in which political interference with health measures is definitely dangerous.

4. We must not be afraid of whatever degree of centralization the total situation may call for from time to time. In most instances, this would not mean the substitution of centralized action *in place of* a local one; it is much more often the development of effective methods of action in larger units, of doing what the smaller units have failed to accomplish or even to undertake. There are underlying, inherent, and to my mind, inescapable factors which lead step by step to the development of participation, either financially or operationally, by larger and larger units—by counties in addition to towns and villages, by the state in addition to cities and counties, by the federal government in addition to states. There is nothing undemocratic about this process. Small local units of government are in no true sense the "shrines" or "schools" of democracy. They are often, under present conditions, its most serious failures, least competent, most wasteful, most given to missing the ball and failing to get results. That plan is most truly democratic, as to the relation between the various areas of government, which works best as times and circumstances change.

5. The vocabulary of public health is rapidly increasing in volume, but there is one word which should not be found in any public health literature or law. That is the word "indigent." It is a sound and necessary word in public relief, but not in public health. Public health is concerned with the welfare of *all* members of the community. It is a public service for the benefit of all who need such service. It has no special interest in indigents or any other economic group as such. The considerations and methods for the control of disease are the same throughout the entire community. Public health activities in this respect must be on exactly the same basis as public education, its opportunities open to all, free to all, paid for out of the total community resources, and available to all with no "stigma" of charity or relief such as would deter many from seeking or utilizing it. As a matter of fact, there is no such "stigma" in the utilization of community services that are intended for all the people needing them. Schools, fire protection, police protection, parks, playgrounds, highways, all these are community enterprises, paid for from general taxation which, as it affects the standard of living and the cost of living, are shared by every person in the community, and every person is therefore entitled to avail himself of these services without feeling, and without it being a fact, that he is "getting something for nothing." He has been paying all along for the maintenance of these health services, and if and when he needs them, or the community needs them for its protection, he is getting something that he has been paying for all along and is now paying for.

6. The preparation of adequate plans for dealing with known health hazards has already been emphasized. It is equally important to keep these plans flexible, and from year to year to consider what modifications have became desirable, or perhaps imperative, by reason of additions to our scientific knowledge. This is true in nearly every field of health activity. New discoveries are not like additional building blocks in the construction of a wall or a building—simply additional material of the same kind. New discoveries nearly always bring not only additional duties—they nearly always call for reappraisal, rearrangement, ofttimes of a fundamental character. The new knowledge may raise doubts about some things taken for granted; it may confirm the validity of what had, up to that time, been a matter of probability.

A very notable instance in one of our long-standing health activities is in the field of tuberculosis. New knowledge as to the effective use of chest x-rays, and new methods greatly reducing the cost of large numbers of x-ray diagnoses put into our hands far more effective facilities than we have heretofore had for the elimination of tuberculosis. It is now practicable to think in terms of x-raying the entire population of various areas, beginning perhaps with areas in which tuberculosis rates are still high. We can get rather definite estimates as to the number of cases which will be discovered in the various stages of the disease. We can formulate tentative estimates as to the additional number of hospital beds that will be required, and as to the numbers for whom partial or complete rest at home may be adequate. We can also judge as to the frequency with which such x-ray examinations will need to be repeated in any given locality, in order to catch the most recent infections.

While this knowledge of more effective tuberculosis methods has been available for some years, little has been done in planning a thorough-going job in taking the complete measure of tuberculosis in given areas, and of providing

for such areas all the facilities required for making the fullest use of the result of the diagnostic examinations.

The changing types of curative treatment for syphilis within much shorter periods, as well as for gonorrhea, present the possibility of revolutionary gains in the control of those diseases, and so all along the line. We have to learn to be comfortable in the presence of possibilities of change, without notice, so to speak, in the scientific bases of all our health activities. Also, of course, we have to keep an eye out at all times for new knowledge bringing other diseases into the preventable category. Not all of these will require the aid of health authorities, but many of them will.

In all that has been said as to the importance of the promotion of health as a very direct and dynamic form of social security, there is no intention of underestimating in the slightest degree the importance of the various forms of social insurance and social security as related to those interferences with income as to which the causes are not preventable by any practical means now within our knowledge and capacity. On the contrary, the situation is in no degree that of exclusively either this or that. It is a question of both. It is highly significant that in the original Federal Social Security Bill there was included a provision authorizing an additional appropriation of $10,000,000 a year to the U. S. Public Health Service. This authorization was subsequently raised, and I believe now the ceiling has been removed from such appropriations. The fact that this was included in social security legislation is a fine recognition by Congress of the fact that the promotion of health actually is the promotion of social security. There should be the completest understanding and the fullest coöperation, between the agencies at the various levels of government dealing with the various forms of social security, each of which, far from interference, actually does promote and strengthen the other types of security.

Present Status of Health Insurance in the United States*

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TO describe the present status of health insurance in the United States is like trying to specify the position of a speeding train. By the time the words have been uttered the status they portray has become a matter of history—health insurance has moved forward.

It has been said with some scorn that the demand for health insurance trickles from "little groups of serious thinkers." The statement implies that health insurance is only a passing agitation and, to explain it, various causes are chosen and stressed. Ten years ago the agitation was due, assertedly, to the depression; five years ago, to the exhilaration of a rising prosperity; today, to an approaching national political campaign; tomorrow, it will be due, no doubt, to the natural unrest that usually follows a war. One or another of these phenomena is always present as a comforting refuge for those who would dodge the test that differentiates a social movement from a passing fad. Yet, the test is not too complex.

In a social movement the events that occur generate new events and each one exhibits a gain in strength and in force. In a passing fad most of the power is expended in the initial efforts; such subsequent events as occur exhibit the signs of diminishing power and force, the signs of progressive weakness. The test takes time, but time has passed and the experience of ten years is now a part of the record. The evidence of the decade firmly establishes health insurance as one of the more visible signals of a dynamic social movement, a movement that involves all of the health professions, that embraces government, labor, and industry, that excites positive public support and even more positive individual action. Ten years ago health insurance was an issue; today, with all of its imperfections, it assumes the status of an institution.

These are generalizations; now for certain particulars.

As a part of a long series of events, each occurring as though it had fretfully awaited its moment, one might mention the extensive and intensive studies of the costs of illness, the distribution of the health services and the needs of the population. One might mention, also, the innumerable national and state conferences that have involved more and more organizations and greater and greater numbers of people. And one should note, appearing in the professional publications, a heavier and heavier sprinkling of items and articles on the subject of economics. All these, however, might be interpreted as evidence only of a philosophical preoccupation; as evidence, perhaps, of a statistical and verbal interest in the economic problems of the health services. But much more has happened.

First, the hospitals decided to com-

* Presented at a Special Session of the American Public Health Association at the Seventy-second Annual Meeting in New York, N. Y., October 12, 1943.

bine action with discussion and in 1932 began to open their doors and their services to people who had expressed their support of health insurance in a manner that admits of little argument. They had bought and paid for it and they have continued to buy and pay for it. Today 32 states and the District of Columbia have adopted enabling legislation to permit the organization of non-profit hospital insurance plans, and the American Hospital Association, through its Hospital Service Plan Commission, has approved 74 Blue Cross plans that in some instances cover whole states; in others, local areas. And today the approved plans have a subscriber membership that numbers approximately 13 million people. Add to the 13 millions an estimate of those who have purchased protection from mutual and other insurance companies, and the number exceeds 17 millions. If this be a measurement of the total of little groups of serious thinkers in the United States the intellectual future of the country is assured!

The medical plans started later and in too many instances as defenses against that mysterious force called "the government." Thus far, 13 states have adopted enabling legislation for medical plans comparable to that governing non-profit hospital insurance. And here, too, there is evidence of favorable public response. As a rule, the medical plans offered to the public are limited in their scope of service, the usual type of contract providing for surgical and obstetrical care in hospitals. Because there has been no consistent attempt, such as that for the hospital plans, to organize collection and to centralize experience and data, the number of people covered, one million, is a rough approximation. And the number of non-profit medical plans in the country is estimated at thirty-three.

As a third type there are the literally hundreds of industrial health insurance plans, many in existence for decades, whose benefits are open to people connected with specific industries or plants. In some instances, where a town or city draws its support from a single industry, virtually the whole population is included. In the industrial plans there may be found all of the variations that occur in health insurance, from the most comprehensive services to the most limited; from costs that are fully paid by employers to costs that fall wholly upon the employees; from services provided by groups of salaried physicians to services from private practitioners on a fee basis. And, again, the estimated number of people involved, 1½ millions, is a rough estimate.

Though these are the three main types of voluntary plans operating in the country, there are others such as the coöperative plans and those where medical groups offer their services to the public on a basis of prepayment. Nor is this all. The principle of health insurance has spread to the field of public medical service. Even though all or a portion of the costs of health services are borne by public funds, the allotments are made in terms of specified amounts per person or family per month or year. A notable example of health insurance in public medical service is to be seen in the arrangements and contracts of the Farm Security Administration for health services to selected families. As another example, the State of Washington has adopted a program of health insurance that provides complete health services—medical, dental, hospital, nursing, pharmaceutical and appliances to correct vision and hearing defects—for the "senior citizens" of that state, the 62,000 recipients of old age assistance. These are but two of the many state and local instances of health insurance applied to public medical services.

The status of health insurance now presents itself as an ocean-to-ocean panorama of intensive action that involves some 20 millions of people and excites the interest and the imaginations of other millions. Therefore, those who would speak of health insurance as though it were a matter that might call for consideration at some unstated future time demonstrate only one thing —an unwillingness to examine current events that indicate the widening scope of the movement toward more health services for more people.

What has all this to do with public health? Is this a subject that should interest public health workers only in their conventions or in their periods of recreational reading? The answer is an emphatic " NO " because any device or method that brings more health services to more people *is* public health. Yet, too generally speaking, public health workers have maintained a negative attitude toward what is happening in the nation, their states and, even worse, their local areas. To be sure, health insurance is emerging from a background of controversy and as long as it contains controversial elements there are some who prefer the unsatisfactory certainties of the present to the stimulating perplexities of the future. Others lean heavily upon some theoretical crutch of precedent to justify the avoidance of any activity outside of an established pattern of work. Yet such an interpretation of precedent collapses when one reads the early reports of Chadwick, Simon, Smith, and Chapin—those reports that stressed economic factors, that emphasized social problems, and that gave birth and vigorous life to public health itself.

Complete consistency is a rare quality, but there is not even a minor measure of consistency when health agencies reiterate that " public health is purchasable " and through all of the media of education advise preventive services and early diagnosis and treatment and, at the same time, are inattentive to the ways and means whereby the benefits so attractively described may be realized. Not for long can public health workers continue to satisfy their appetite for real contributions and solid accomplishments with such a thin broth of activity.

The official position of public health with respect to the social movement typified by health insurance was defined by the Declaration of Principles adopted by the American Public Health Association in 1940. The Association recommended that health officers " participate with other governmental agencies and with voluntary bodies in planning for the improvement, coördination and extension of medical care." A written principle, no matter how impressive, remains meaningless and innocuous unless and until it is transformed into action. Participation implies something positive; it implies that public health has something definite to contribute to the improvement, coördination, and extension of medical care, dental care, nursing, hospitalization, and the other health services. In short, it implies that public health and health insurance complement each other.

Among those who administer state plans of non-profit health insurance there is a growing recognition of a principle that was discovered by public health many years ago, the principle that successful administration of a state program depends upon the strength and efficiency of local organization. This recognition can lead only toward one of two decisions. The first is to strengthen the organization of health insurance by utilizing the services of an existing local agency; the alternative is to organize a new local agency. What existing local agency would be the logical choice in a coöperative arrangement? The answer seems to be clear; the health department is the only local organization pri-

marily concerned with the health services and its participation is indicated by the very nature of its own work, its own objectives, its own principles.

This is not a plea to save the existing public health organization nor a warning that hurried defensive action should be taken to forestall the development of a new administrative agency. There is a much more fundamental reason for a close working relationship between administrative public health and health insurance. That reason has nothing to do with the survival of the public health agency for the sake of survival; it has much to do with the enrichment and the conservation of human life. The primary question before public health is not what it may get through a close administrative relationship with all forms of health insurance but rather what values it has to contribute.

High on the list of values is the concept of preventive health services. An examination of the existing health insurance plans forces the conclusion that prevention is a rare element. This is not a criticism of those who conceived the plans; it only emphasizes the point that those who think in terms of prevention contributed little to the planning. Had public health workers participated, even those plans that provide limited services might have included more preventive care. As an example, the most limited medical plan includes obstetrical care but the service is sharply defined—it begins with labor and ends with delivery. Antenatal and postpartum care have been excluded from the contracts for services and those contracts cover hundreds of thousands of women that represent hundreds of thousands of missed opportunities for those who make public health their career.

The same situation obtains in the limitation upon the use of hospital facilities for diagnostic purposes. Here is missed the opportunity to further the early diagnosis that public health advocates as the essence of case finding and of prevention. When the more comprehensive plans exclude the treatment of venereal diseases upon a basis of some hazy assumption that self-supporting people will receive service from " the state " and when other plans build a barrier between subscribers and physicians by making charges for " first calls," as a clumsy device to control the demand for services, it is obvious that the preventive concept, the importance of early treatment, and of easy rather than difficult access to the physician carried too little weight in the planning. It is not only the correction of the defects of past planning that should interest those in public health. The future plans are now being fashioned, plans that involve expansions of hospital care and medical care and plans that extend into dental services and nursing care. Think of the vistas that may present themselves to public health workers who carry to the planning conferences what they know about public needs.

Whether local health departments should or would participate in the actual administration of health insurance may be debated endlessly. But whether the qualities and the disciplines that comprise public health administration are a valuable asset to the administration of health insurance is subject to little question.

No one can minimize the importance of the training and experience in the ways and means of education, in the practical application of statistical methods and in the technics of analyzing community problems and needs. And added to these is the quality of dissatisfaction that expresses itself in administrative research, seeking new and better answers to old problems, seeking first answers to new problems as they appear. All these and more make up public health administration and all

have their places in the administration of health insurance.

There is no implication here that the health administrator by his present training and experience is fully equipped to participate in the organization and administration of health insurance. What he does have is a solid foundation to which may be added new knowledge and new skills in the same manner that they have been added before—by reading, by discussion, by observation, by postgraduate courses, and by graduate training.

In the history of public health there have been a number of periods when the question of expansion presented itself and pressed for an answer. From each of those periods public health emerged with a broadened field of activity. Another such period is here.

The initiation of health insurance and its growth to the present status place the issue and the tangible methods of participation squarely before the public health workers throughout the country.

From Social Security to Public Health in Chile*

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A FRENCHMAN once said that society creates injustice and the law tries to correct it. The wave of optimism which swept the world after the last World War and which gave birth to the League of Nations, the Hague, and other institutions was as well intentioned as it was incapable of assuring a permanent solution. That wave of optimism reached Chile, but only after a certain delay. Men who were public spirited took this initiative and tried to apply it, out of a sense of purest social justice. As a result of these movements, a series of laws of social security and protection to the weak came into being, profoundly affecting the organization of the country, the practice of medicine, and the present and future of public health. Among these laws we should mention:

1. The law of compulsory insurance against illness, disability, and old age, which takes in the wage earners in the lower brackets. This law provides benefits not only for the person insured, but for his wife during pregnancy and for his children under 2 years of age. The contributions consist, generally speaking, in percentages of the salaries amounting to 2 per cent for the worker, 4 per cent for the employer, and 1½ per cent for the Government. It includes medical, surgical, and dental attention, medicines, hospitalization, and weekly cash allowances up to one year. Complete, permanent disability pensions vary between 50 per cent and 100 per cent of the last year's salary. Old age pensions, effective at 55, 60, or 65 years of age, as may be requested by the pensionee, depend on the number of contributions made. Under this law, at present, more than one-fourth of the citizens of Chile receive benefits, and if an amendment to the law now pending in Congress, is passed, it will provide for insurance to each member of the worker's family, bringing the total of persons insured under this law to around three-quarters of the population of the country. It is pertinent to observe that the farm laborer, who in our countries usually receives less consideration, has equal rights with the urban worker.

2. In contrast to the provisions of the above mentioned law, the workmen's compensation law, although it establishes the personal responsibility of the employer, allows him to meet this responsibility either personally or by insurance of his employees through a semi-governmental or commercial company. Because of this choice, only one-fifth of the eligible workers are insured. For purposes of compensation, in addition to accidents, 13 types of poisoning and 23 occupational diseases are included. The beneficiary is entitled to medical care until he is either cured or pronounced disabled, and to

* Presented at a Special Session of the American Public Health Association at the Seventy-second Annual Meeting in New York, N. Y., October 12, 1943.

allowances ridiculously insufficient to provide for his needs and those of his family. No systematic effort is made toward accident prevention or rehabilitation. An amendment is under consideration which will make insurance compulsory, increase the allowances, and provide for accident prevention.

3. Hospitals in Chile, established by private philanthropy, have been by tradition almost entirely devoted to the care of the indigent. In 1932, these hospitals were grouped together under the control of the State, and their income increased by appreciable governmental contributions, as well as by the fees paid for the care of the insured. In this way almost all hospital care, as well as a great part of the care in outpatient departments and sanatoria, is a monopoly of the State.

4. The so-called Preventive Medicine Law compels both workers and employees to submit to periodical health examinations for the early diagnosis of tuberculosis, syphilis, and heart disease. When one of these diseases is recognized in a curable stage, the patient is entitled to complete or partial rest, receiving, respectively, either his whole salary, or half of it. During this period and for 6 months thereafter the employee may not be discharged from his position. For the purpose of this law, 2½ per cent of the gross income of all social security institutions is set aside, plus 1 per cent additional contribution from the employers. This 1 per cent is devoted entirely to the so-called preventive rests.

5. Finally, there are in existence social and economic insurance banks, which we call *Cajas,* for public and private employees, for members of the armed forces, etc., which total some forty. Some of them are combined in a so-called National Medical Service. Although they provide some medical and dental attention and comply with the provisions of the law of preventive medicine, they are more nearly of an economic nature. They provide retirement pay, disability and old age pensions, unemployment allowances, and loans for the purchase of property. This has contributed in a positive manner to the subdivision of land.

All these systems are based on three contributions: that of the insured, which gives him a sense of right to these services; that of the employer, who has a very practical interest in the welfare of his workers; and that of the State, to make for a more equitable division of the country's wealth. The spread of these insurance systems throughout wide sectors of the population may have influenced greatly the *esprit de corps* among our laborers, as well as the development of labor unions and political parties, which inspire, in a great many Chileans, what might be called a healthy fear. The decisive participation of the State in these organizations and its consequent control of them is, obviously, contrary to liberal thought, but is entirely in harmony with the duty of the State to protect the health of its people, as recognized in our constitutions, and with that of the individual to maintain his health both for his own good and for the good of others.

There exists a consensus of opinion to the effect that these laws have serious defects in their financial and economic bases, that the number of their provisions render their administration unwieldy, and that they have not fulfilled their purpose. This failure is indicated by the fact that they have shown no perceptible influence on the general morbidity and mortality of the country. They have promoted the accumulation of considerable capital in a country where this is scarce, and have thus become a force to be reckoned with. They have enhanced the power of the State to a degree which may one day constitute a danger, if used un-

wisely. It may burden industry and add to the cost of production while raising the standard of living of the worker. Among the effects, both favorable and unfavorable, which this system has produced in the field of health and medicine should be mentioned the following:

1. Social medicine to a degree unequalled in any other part of the Western World. Almost all doctors in Chile receive salaries from one institution or another, and these salaries constitute, for many, the major part of their income. As a consequence, private practice is rapidly disappearing.

2. A growing preoccupation with mass medicine, so much so that even private practitioners pretend an interest in it. Perhaps as an indirect result of this, doctors are taking a more and more active part in national politics.

3. Augmented and improved medical attention which now reaches people of small means and isolated districts.

4. Consequent increase in the number of hospital and sanatorium beds, although not yet to a satisfactory degree.

5. Greater impetus to health education, which has existed for some time in the public health service and which other institutions have now undertaken in a sincere, although not always effective, form.

The social security plan was created and developed when the sanitary service, although relatively well established along European lines, still lacked a concrete structure adequate for the conditions of the country. Naturally it took second place as compared with the other forms of individual medical attention. Its income, derived entirely from the national budget, does not amount to as much as 5 per cent of the total expenditure for health and medical care.

The public health man must be realistic. He must not waste his energies in bewailing a state of affairs or in a futile attempt to stem a current stronger than he. Whether you believe in the virtues of social medicine or not, in Chile you can neither belittle nor destroy it. In consequence, we do not propose to construct an edifice of public health to oppose social security. Rather we are trying to steer a new course toward disease prevention and the defense of health. Within this concept, social security becomes the platform for public health or, better, we might say that social security *is* public health. Let us review, briefly, what we have accomplished and what we have yet to do.

The workmen's insurance institution now undertakes attention to the children of its insured up to 2 years of age. For this purpose it has established a chain of stations throughout the country where trained pediatricians periodically examine them and furnish cow's milk free to those who are not breast-fed. Simultaneously, obstetricians examine the mothers during pregnancy and, with the help of midwives, take care of the delivery and puerperium. Every working woman belonging to this or any other Caja is entitled to a maximum of 6 weeks' rest with full pay both before and after delivery. As children under this care constitute a fourth of the population up to 2 years of age, this measure may have contributed decisively to an appreciable decrease in infant mortality. Figures likewise reveal a decrease in maternal and neonatal mortality, and this may be attributed in large part to the obstetricians and midwives of the insurance fund.

Some ten ears ago the President of the Republic was empowered to declare obligatory the pasteurization of milk in such zones as he might indicate. This he has done in certain cities, among them Santiago, which has almost one-fifth of the population of the country.

The same workmen's insurance bank has constructed or purchased several pasteurization plants and, indeed, has virtual control of all pasteurization. At the same time, canned milk has become very popular. Both these measures have contributed to a definite improvement in the quality of milk sold, and probably to a consequent diminution in infant mortality and the incidence of enteric infections.

The preventive medicine law has already performed some 600,000 systematic health examinations through which it has been possible to institute treatment and rest for cases of tuberculosis, syphilis, and heart disease, when curable. Nevertheless, its greatest accomplishments have been the organization of medical groups, permanently located in some parts of the country and ambulatory for smaller districts, composed of doctors, dentists, nurses, special workers, and auxiliary personnel, having at their disposal x-ray, laboratory, electrocardiographic, and other equipment. Moreover, and this is of major importance, it has given us a truer picture of tuberculosis throughout Chile. Thanks to this more than to any other factor, we now realize that tuberculosis in Chile is in the epidemic stage and, consequently, we have oriented our campaign toward the suppression of the sources of infection through isolation of the infectious cases or their ambulatory treatment through pneumothorax.

The public health service, the workmen's insurance, and the social welfare offices have recently pooled their resources to undertake a national campaign against venereal disease. Clinics have been established in Sanitiago, Valparaiso, and three southern provinces, where free treatment is given to the insured and destitute, where there is epidemiological investigation and better control of prostitution. Among other interesting developments are the provision of beds for the isolation of infectious cases and the treatment, with very satisfactory results, of some thousand cases of syphilis through the continuous drip method or through frequent large doses of arsenicals.

Thanks to the efficacious and generous assistance of The Rockefeller Foundation, there has been established this year in Santiago the first full-time health unit, long an aspiration among us. In this unit we have tried to bring together all the resources offered by the various institutions mentioned earlier, to unite them in one integrated system of health protection. Among the achievements, special mention should be made of the fact that, for the first time, it has given to public health nurses the place they merit, and that it has undertaken a health survey which has already covered some 8,000 families. An equally modern program is under way in the city of Antofagasta, due exclusively to national initiative.

We firmly believe that these health units will be one of the forces through which we can bring together and direct the resources of social security and welfare, together with those of public health, toward a mass medicine which will be essentially preventive in character. The recently created Public Health School, which will open next April, will constitute another force. Its students will be made up of doctors recently graduated or who belong to the national Public Health Service, the insurance institutions, or other agencies of public medicine, and they will be taught the principles and practice of public health: statistics, epidemiology, health administration, sanitation, and later nutrition and industrial hygiene. We shall try to permeate and inspire medical agencies in our country with a new spirit of public health.

It should be mentioned here that this school is a result of the combined efforts of the University of Chile, the Public Health Service, the Bacterio-

logical Institute of Chile, and The Rockefeller Foundation, and that it will be provided with the most modern of laboratories and equipment by the Institute of Inter-American Affairs. Thanks to the generosity of these two American organizations, and also to the Pan American Sanitary Bureau and the Kellogg Foundation, an appreciable number of our doctors, nurses, and engineers are coming to the United States to complete their public health training. They are to hold important positions in the School of Public Health and in the various medical and public health organizations. It would be no exaggeration to say that this group of young and enthusiastic workers will constitute our first line in the advance of public health.

Throughout the world the public health service has outgrown the small, primitive agencies designed to defend the borders against the invasion of disease, or to combat endemic plagues, or to cope with national disasters or other emergencies, or to take care of local problems, generally of a cleanup nature, which today are somewhat looked down upon. It might also be created, ex-novo, to control situations engendered by community life. But Chile was the first country in America to establish social security, and its experience, both favorable and unfavorable, has served as a guide for similar legislation in others of our countries. Chile has carried it forward and diversified it to a degree unknown in any other democratic nation, and in this same soil, public health will flourish. It is questionable whether our example is worthy to be followed, because the road has been a long and tortuous one, exhaustive both of money and effort. At any rate, it is evident that our case constitutes a source of observation and meditation for those interested in social security and public health and the relationship between the two. It is clear, too, that it offers us vistas both wide and incomparably intriguing.

The Proposed Canadian National Health Bill*

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CANADA has been careless of the health of her people. This is indicated by the high death rates which prevail. It has been thought in Canada that every person was capable of earning an income sufficient to provide his own health needs and those of his family. The depression showed we were wrong, but the depression alone was insufficient to cause legislators to take steps to provide the people with adequate housing, nutrition, and health facilities. It needed a war to do so. Indifference, neglect, and special privilege have stood in the way of improving living conditions and of reducing morbidity and mortality. Health departments have never had sufficient funds nor adequate leadership comprising personnel fully trained in various public health activities.

Not only are death rates in Canada excessive, but the percentage of physical defects is high. Forty per cent of recruits suffer from physical defects. In a study in one province of Canada it was found that 70 per cent of young people between the ages of 13 and 30 have one or more remediable defects. Some of these are serious. Maternal mortality, infant mortality, tuberculosis, venereal diseases, and mental diseases are excessive. Diseases of middle age, such as heart disease, cancer, and diseases of the arteries and kidneys are increasing. The solution is the adoption of a modern Public Health and Health Insurance Plan which will include a comprehensive reorganization of public health departments and the provision of full and complete medical care for all of the people of Canada.

With this object in view the Honorable Ian A. Mackenzie, Minister of Pensions and National Health, in May, 1941, issued instructions to the officials of the Department of Pensions and National Health to discuss the subject of the health of the people of Canada at the next meeting of the Dominion Council of Health with the object of initiating a comprehensive study of public health and medical care leading to the adoption of a Public Health and Health Insurance Plan for the Dominion. To this meeting were invited representatives of the Canadian Medical Association, Canadian Hospital Council, the medical faculties of universities, the Royal College of Physicians and Surgeons, and voluntary health organizations, as well as representatives of interested governmental departments.

The Director of Public Health Services presented the subject of public health and medical care for discussion. Deficiencies in the field of public health were stressed and particularly those respecting tuberculosis, mental diseases, maternal mortality, infant mortality, and the diseases of middle age, all of which are controllable by known public

* Presented at a Special Session of the American Public Health Association at the Seventy-second Annual Meeting in New York, N. Y., October 14, 1943.

health measures. The discussion brought out the following facts:

Both incidence and mortality of tuberculosis are excessive. Moreover, the rate of reduction of mortality is much more rapid in some provinces than in others and especially in those provinces in which adequate preventive and treatment services are provided. A striking feature of tuberculosis is the high mortality rate in Quebec and the Maritimes. It is believed that the most effective factor in the reduction of tuberculosis is free treatment integrated with preventive services. Tuberculosis should not exist in any civilized community. The presence of tuberculosis in a community is an index of lack of interest in the health and welfare of the people.

In respect of mental diseases, it was made clear that the situation is grave. The number of cases is increasing. There is a shortage of 10,000 beds and there are many mentally ill persons walking the streets for whom no accommodation is available. It is the Canadian experience that more beds are utilized for the treatment of mental illness than the total number of beds required for the hospitalization of all other diseases. Apart from the question of accommodation, there is lack of professional staff—doctors, nurses, and other personnel. Many providing services for mentally ill persons are inadequately trained and facilities for occupational therapy and recreation are few. The number of psychiatric clinics is small. There is no organized system of supervising discharged patients, of finding work for them, of teaching them to care for themselves, or of teaching their families to care for them; nor is there a program of vocational guidance and training for mental defectives. Organized community care is negligible. Although it is known that we should be concerned with problems of mental health relating to earliest childhood, school age, working life, and home life, little, if anything is done in that direction. The seriousness and scope of the mental problem in Canada is causing concern. In order to insure progressive improvement of all methods of control of mental illness, future planning should comprise ample facilities, including scientific research.

Statistics regarding the venereal diseases are incomplete, inasmuch as doctors, generally, do not report their cases. Nevertheless, statistical reports provided by venereal disease clinics indicate that the incidence of syphilis and gonorrhea is high. It is considered that venereal disease control measures are inadequate, and a new and far-reaching venereal disease program is necessary, as it has been demonstrated that in countries where adequate measures for the control of venereal diseases have been adopted a definite reduction in incidence has been obtained. There is no doubt that a complete program would effect a reduction not only in the incidence of the venereal diseases but in institutional and hospital care generally, as well as in mothers' allowances, old age pensions, and poor relief, all of which bear a relation to these diseases. In Sweden, approximately only 7 new cases of syphilis occur annually for every 100,000 of population, whereas in Canada at least 70 new such cases are reported by clinics alone. It is clear, therefore, that the problem is one that requires active consideration.

The maternal death rate in Canada is extremely high when compared with other countries with a similar standard of living—and, in fact, may be considered excessively so. Our experience in Canada indicates that, wherever special measures have been adopted to provide adequate maternal services, the death rate decreases rapidly.

Infant mortality parallels maternal mortality. Each year during the last 10 years Canada has lost on an average

15,000 children under 1 year of age. These deaths are largely due to causes which are preventable or controllable. Where active measures are adopted to reduce infant mortality, they are successful. For example, in certain cities of the United States in 1900, 1 out of every 6 children died during the first year of life; by 1920 the ratio had dropped to 1 in 12, and by 1940 to 1 in 21. Infant mortality is very definitely one instance where money can purchase life.

The rate of population growth in Canada over the past 30 years has been decreasing rapidly. From 1911 to 1921 the rate of increase was 34.17 per cent; from 1921 to 1931, it was 18.08 per cent; and from 1931 to 1941 only 10.8 per cent. Maternal and infant death rates, together with the aging of the population and the cessation of immigration, are a serious matter from the standpoint of the future of the country.

Communicable diseases take an unnecessarily large toll of life. This is due to inadequacy of health services and particularly of local health services. In fact, one of the greatest needs of the present day is the establishment, maintenance, and extension of local health services. The adoption of such services in rural areas would have the immediate effect of reducing morbidity and mortality of communicable diseases and especially of maternal and infant mortality.

Inasmuch as essential preventive services are inadequately provided throughout the country, it is clear that new measures must be formulated and adopted. In the realization that the adoption of such measures requires a broad and comprehensive plan to cover the entire country, a Public Health and Health Insurance Bill was prepared. For the purpose of formulating such a plan, it was considered essential that the views of the most representative groups in the country should be obtained. For this purpose, an Advisory Committee on Health Insurance was formed. This committee, after formulating a general plan, requested representative groups throughout the country to create public health and medical care committees. The following organizations formed such committees:

The Canadian Medical Association
The Canadian Dental Association
The Canadian Pharmaceutical Association
The Canadian Nurses Association
The Canadian Hospital Council
The Catholic Hospital Council of Canada
The Canadian Public Health Association
The National Council of Women
The Catholic Women's League
The Federated Women's Institutes of Canada
La Federation des Femmes canadiennes francaises
The Canadian Welfare Council and Canadian Association of Social Workers
The Trades and Labour Congress of Canada
The Canadian Federation of Agriculture
The Canadian Manufacturers Association
The Canadian Life Insurance Officers Association.

The great majority of these organizations made direct representations and approved the general principles laid down in the draft Health Insurance Bill.

Perhaps the culminating achievement of the Advisory Committee on Health Insurance, aside from the draft proposals which constitute its report, was the unprecedented assembling between annual conventions, for the first time in 75 years, of the General Council of the Canadian Medical Association, when this great and influential body formally went on record in favor of the principle of health insurance.

The modern conception of health insurance is the reduction of morbidity and mortality by prevention and treatment, and it was with this object that the Advisory Committee on Health Insurance drafted a combined Public Health and Health Insurance Bill.

Subject to the provision of this draft Bill, the Governor in Council may make an agreement with the Lieutenant-

Governor in Council of any province to make grants for public health and medical care, provided that the province makes provision for utilizing both grants. The grants are specified in the First and Third Schedules to the Bill and the proposed statutory provisions are contained in the Second Schedule.

The draft Bill is based on compulsory and contributory insurance. It is planned to include all persons resident in Canada by agreement with the provinces. It is considered essential that everyone in Canada should be provided with health insurance; nevertheless, no compulsion is placed upon the provinces in this respect other than that all indigents must be included in the plan.

To provide health insurance, it will be necessary to create a Health Insurance Fund comprising money contributed by insured persons, employers, Provincial Governments and the Dominion Government. By so distributing the cost, the financial burden will be considerably lessened.

After careful thought and consideration, it is believed advisable from the standpoint of the collection of contributions to divide insured persons into two classes: "employed insured persons" and "assessed insured persons." The payment of contributions has been so devised that these classes will contribute in proportion to their wage or income. If an employed person is capable of paying the entire cost for himself and his dependents, he shall be obliged to do so. If unable to pay the entire cost, his employer will pay the difference for him, and the province for his adult dependents. The combined contributions of employer and employee will be supplemented by a Dominion grant. Assessed insured persons are the unemployed who have an income from a source other than wages, or who are indigent. Like the employed insured persons, the assessed insured person, if he can do so, will pay the entire cost for himself and adult dependents; if not, the province will pay the difference. Financial assistance will be provided by the Dominion Government. There will be no charge for children up to a prescribed age—16 years.

As soon as health insurance is adopted in a province, all residents will be registered and classified and will be instructed to select a doctor from a list provided after consultation between the Provincial Health Insurance Commission and authorized medical committee appointed for the purpose. If the insured person wishes, he may select a clinic instead of a private practitioner.

The method of payment of physicians, nurses, and others will be left to the decision of the Provincial Health Insurance Commission. Also, it is considered desirable that the services of the physician should be utilized for prevention as well as treatment. Thus, the physician will have a responsibility for the health of each member of the family and be responsible for public health measures designed to reduce morbidity and mortality. He will act as counsellor and adviser in respect of the health of the family as a unit.

The benefits comprise prevention of disease and the application of all necessary diagnostic and curative procedures and treatments, including medical, surgical, obstetrical, dental, pharmaceutical, hospital, and nursing benefits and such other ancillary services as may be deemed necessary. Provision is not made for cash benefit due to unemployment caused by illness, as it is considered that such benefit should be provided by other means.

Medical benefits include the services of a general practitioner, consultant, specialist, surgeon, obstetrician, hospitalization and nurse, and ancillary services. Nursing in the home is con-

fined to the visiting nurse, except where the circumstances are such that bedside nursing is essential.

Dental benefit must of necessity be restricted, as the number of dentists in Canada is insufficient to provide full and complete dental care for all. It is proposed that a committee of the Provincial Dental Association shall make an arrangement with the Provincial Health Insurance Commission to provide every child up to 16 years of age with a semi-annual dental examination and such reparative dentistry as is needed. Dental care may be provided others to the extent that the funds and the number of available dentists will permit.

Pharmaceutical benefit shall be provided in accordance with a list of drugs to be drawn up in coöperation with the Provincial Health Insurance Commission and a committee of the Provincial Pharmaceutical Association. Special provision may be made respecting drugs and pharmaceutical preparations known as specialties.

Hospital benefit is to include general ward services unless the insured person wishes by paying the difference to obtain semi-private or private room. In special cases accommodation other than general ward may be provided. The terms of agreement for hospitalization will be arranged by the Provincial Health Insurance Commission with a committee of the Provincial Hospital Groups.

Nursing benefit, outlined above, will be provided by the Provincial Health Insurance Commission in coöperation with a committee of the Provincial Nursing Groups.

Provision is made for administration through a Health Insurance Commission in each of the provinces. In considering the question of administration, it was the opinion of the Chief Medical Officers of Health of the provinces and the Advisory Committee on Health Insurance that administration should be by the Government for the people through Provincial Departments of Health. Nevertheless, the Canadian Medical Association and other professional and lay groups favored a commission. In view of this preponderance of opinion, provision has been made in the draft Health Insurance Bill for a commission comprising a chairman who shall be a doctor of medicine, the Deputy Minister of Health of the province (ex-officio), and such other number of persons as may be determined from time to time by the Lieutenant-Governor in Council after consultation with representatives of professional groups, labor, agriculture, industry, women's organizations, etc.

Provision has been made to provide benefits only after the Health Insurance Commission has consulted with professional groups providing benefits but, should these groups not coöperate, the Health Insurance Commission is empowered to appoint committees for the purpose. The Health Insurance Commission is obliged to study the resources of the province and facilities available for providing benefits and to divide the province into health insurance administrative and public health areas.

The supervision of the provision of benefits is to be placed under Regional Officers.

The Health Insurance Commission may be authorized by regulation to establish such committees, councils, or other bodies or instrumentalities as may be deemed advisable for consultative, advisory, and executive purposes as well as for obtaining effective coöperation in the administration of the Health Insurance Bill. The constitution, duties, and powers of such committees, councils, etc., shall be prescribed by regulation.

Inasmuch as Dominion administration is confined to the administration of Dominion grants, it is not considered

necessary to create a Dominion Health Insurance Commission, as administration may be carried out by a Health Insurance Division in the Department of Pensions and National Health under a Director of Health Insurance.

One of the chief disadvantages of administration of health insurance provincially is decentralization. To overcome this, provision is made in the Bill for the creation of a National Council on Health Insurance, comprising the Director of Health Insurance as chairman, the chief medical officer of health, as well as the chief administrative officer of health insurance of each province which has established a health insurance act, and such other persons, comprising a representative of the doctors, dentists, hospitals, pharmacists, nurses, labor, industry, agriculture, and urban and rural women, respectively, as may be determined by the Governor in Council. None of these will receive remuneration but will be paid travelling expenses and maintenance.

The various Grants contained in the draft Bill are as follows:

A Health Insurance Grant to assist the provinces in providing health insurance benefits as outlined.

A Tuberculosis Grant to help provide free treatment for all persons suffering from tuberculosis, including the provision of additional buildings and bed accommodation. The reduction of mortality in those provinces which provide free treatment indicates that the provision of free treatment is an essential to the elimination of tuberculosis.

A Mental Disease Grant to assist in the provision of free treatment for those suffering from mental illness, including the provision of additional buildings and bed accommodation. In this field, Dominion assistance is urgently needed.

A General Public Health Grant to assist the provinces in establishing and maintaining public health services commensurate with the needs of their people. The same problem has confronted the United States and has been solved by the provision of funds to raise the per capita expenditure on public health and to meet special needs.

A Venereal Disease Grant to aid in providing preventive and free treatment for persons suffering from venereal diseases on the same basis as the original Dominion venereal disease grant of $200,000 which was discontinued in 1932.

A Grant for Professional Training to afford financial assistance to doctors, sanitary engineers and others who wish to take university courses leading to degrees in public health.

An Investigational Grant to enable the provinces to carry out special public health studies. It has been found impossible to carry out studies in public health and to provide skilled personnel during epidemics because of lack of funds.

And a *Crippled Children Grant* to prevent and control crippling conditions in children.

It will be clear from this brief summary that, apart from the reduction of morbidity and mortality of disease, the primary object is the integration of public health and medical care for the purpose of raising and maintaining the standard of health of the people.

The draft Bill as outlined above has been presented to a Special Committee on Social Security of the House of Parliament and has been approved in principle by that committee. The plan has been discussed with the Ministers of Health of the Provinces, who are coöperative.

In addition, the Dominion Government has passed a National Physical Fitness Act creating a National Council on Physical Fitness and a Physical Fitness Fund. The object is to coordinate the efforts of all governmental and other agencies engaged in the field of physical development, physical culture, sport and recreation.

NOTE: A Committee on Finance is at work on the question of collection of contributions. It is probable that the method recommended in this article will be modified.

The Evolving Pattern of Tomorrow's Health*

Future of Public Health in the Western Hemisphere

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Undersecretary of Public Health of Cuba, Havana

THE science of public health, which has undergone an extraordinary development in recent years, during which many allied disciplines have been incorporated with it, constitutes at the present time a true specialization, indispensable for the care of health in communal life. Outstanding among these specialists we find the physician and engineer as fundamental elements of the whole public health structure. They must needs be helped by a series of experts, also important, and in which auxiliary group we must signally mention the public health nurse.

Many years have gone by since the time of that elementary public health, indeed purely a sanitary police in its methodology, which covered the first period of preventive medicine with the establishment of so-called quarantines. These were representative of the spirit of sea-going men, and of those in care of the debarkation ports of these great continents, to whose ports flocked tidal waves of immigrants from Europe in search of religious freedom. This was to be the foundation of the Thirteen Colonies—bulwark of the North American nationality, today grown into this formidable and vigorous country, principal champion and defender in the titanic struggle of the democratic countries of the world against the enslaving onslaughts of the totalitarians.

These early concepts of health have steadily been changing to a more thorough and ample preservation of the health of the conglomerate inhabiting our countries. Such a function has grown until it has become a primary duty of the State. It is clear, of course, that in speaking of health we must fundamentally take into consideration the environmental living conditions. These include the habitation itself, the clothing and the nourishment of the individual, his habits and customs, his physical and intellectual education. In brief, the present conception of public health acquires importance whether the point of view from which we study it be properly technical in its medical aspect, or be it political, in respect to the responsibility of the State.

Public health, born in the way we have very summarily described, pursued its development—although rather unequally—in the countries of our two Continents, becoming the exponent of hygienic culture of each one, and conditioning the development to political, social and economic factors. Nevertheless, it may be set forth that in this protracted period there were marked examples of the effort and firm desire of the nations of America to rise against many obstacles and to improve their public health standards. No better proof of this assertion exists than the

* Presented at a Special Session of the American Public Health Association at the Seventy-second Annual Meeting in New York, N. Y., October 14, 1943.

magnificent pages written in medical and public health history by the glorious research and public health accomplishments indelibly linked with the names of Finlay, Reed, Oswaldo Cruz, Liceaga, Carrion, Guiteras, Gorgas, Lebredo, and many more gallant soldiers of the common good, distinguished in the public health struggle in this hemisphere.

The circumstances of the universal conflict in which the United Nations are involved, in defense of human liberty and welfare, have thrown us more closely together and given greater cohesion to our ranks. This has powerfully contributed to a greater knowledge among ourselves, the creation of a real and solid friendship among the peoples of our Continent, and to give vital and objective expression to what was at first a philosophical enunciation: "The Good Neighbor Policy." We are living, therefore, a real and positive application of this doctrine, whose propounder, President Roosevelt, set it forth under the dictates of a sentiment of fine sincerity. The Pan American Sanitary Bureau, that wonderful organization for inter-American connection, endowed with high and extraordinary functions, has done much, under the tactful leadership of that highly respected Pan American figure, Dr. Hugh S. Cumming, its Director General, ably helped in his strenuous work by the tireless secretary, Dr. Aristides Moll.

Parallel to the development and growth of the United States Public Health Service, there was created a society to discuss and consider the scientific principles, the new discoveries, which serve as a base to public health measures; thus was born the American Public Health Association, a splendid organization, model and standard in its class, which is making a signal contribution to the war effort by holding this 72nd Annual Meeting, in which there are present as participants a large Latin delegation through the invitation of the Association. It would be foolish to deny the extraordinary importance of the combined action of these organizations, whose activities are linked in a practical way through the corresponding public health officials, and which at the same time extend benefits to the whole hemisphere by means of the coördinating mechanism established through the Pan American Sanitary Bureau.

If in times of peace these connections represent a prime factor in the machinery of applied public health science, in times of war this importance is enormously multiplied. The sanitary factor is of paramount value in all respects, as in the mobilization, selection, and training of front-line troops, or in the hygienic and medical care of the enormous civil home-front, the civilian production and supply battle-front, which has given the present war its characteristic of active participation of all elements.

Gone are the times when communications were slow and difficult. The astonishing marvels of oceanic travel given us by those fast ships that sailed to Europe from American shores in but a few days' passage, have shrunk to invisibility before the fantastic speeds attained by aerial travel, which today consume in a world-girdling trip the time before spent in journeying between not-so-distant cities. This speed of travel, which is a wonderful exponent of the progress of mechanics, at the same time destroys and annuls the barriers heretofore erected for our protection and isolation. In spite of science's advance and conquest, there still exist, in different places of the globe, foci in which certain causes of disease have established strongholds—agents capable of causing terrible infectious diseases, of maintaining grave endemic diseases, and which from time to time break out of bounds, invade great territories in deadly epidemics, and not so rarely reach such proportions in time

and space as to constitute pandemics.

The centers of research have indeed made gigantic efforts to study and ascertain the causes of disease, contributing to the exact knowledge of the causative agents, and therefore opening the road to preventive treatments, often placing in the hands of the public health specialist the proper immunizing vaccine. In this position, happily, we find ourselves in the fight against yellow fever —that deadly and vicious tropical plague—the discovery of whose vector belongs to the genius of Carlos Finlay, its experimental proof to the American Commission, and its preventive immunization to the technicians of The Rockefeller Foundation, enabling present-day control of the disease. Cholera, bubonic plague, diphtheria, tetanus, and many more, are today diseases which can be prevented by the use of correct immunological procedures employing the corresponding vaccines.

But infection is not the only aggressor to undermine the individual's body through diverse maladies; there are other bodily ills derived from the absence or deficiency in the organism of food. It thus becomes necessary to consider the sanitary control of foodstuffs as one of the factors preserving that physiological equilibrium called health, and it is clear that in this respect sanitary controls are indispensable and encompass a very ample field. This second aspect of foodstuffs gives us a new and most extraordinarily attractive field, that of agriculture and industrial hygiene. The simple mention of this brings to mind its vast extension and all the possible divisions to which its study may be directed. We may thus consider foodstuff conservation and distribution in its social and hygienic perspective.

Thus reviewing the subjects mentioned, we realize how very ample is the matter comprised, not only in its extent, but also in its depth and implications. This places the rôle of all officials of public health departments on a highly important and responsible plane. Be they named ministries, secretaryships or departmental agencies, all are indubitably organizations essential to the fulfillment of a basic function of the state.

All these considerations explain the existence of different sections in the American Public Health Association, and also the different divisions that function in the United States Public Health Service.

We do not wish to ignore the opportunity to underline the wonderful contribution to the progress in hygienic attention of the habitation and habitat represented among the specialized services by the public health engineer. He is the physician of the habitat, and on his shoulders weigh at present great and important responsibilities. Public health engineering must be well respected wherever it is desired to reach the minimum standard of the life of human beings.

War requires special controls to assure the vigor of the soldier and his physical integrity. Health agencies, both military and civilian, are therefore elements on which the greatest efforts are concentrated in order to win the war. It is essential that we develop for these needs a new kind of public health expert, specializing in a complex science, integrating many fractions of allied sciences and characterized in all things by an essentially preventive way of thinking. If we are to do our duty to these ideals we require a coördinated collaboration among all responsible elements of the Continent. There is no better instrument, in my opinion, to bring this about that the combined action of two organizations of great prestige, standing and consideration in the Continent: these are the Pan American Sanitary Bureau and the American Public Health Association.

In view of the foregoing considera-

tions, we arrive at the following conclusions:

1. It is recommended that a joint Committee be organized between the American Public Health Association and the Pan American Sanitary Bureau with the aim of revising current legislation relating to epidemiology and anticipating prompt adoption by all nations of the continent.

2. It is recommended that the American Public Health Association offer its coöperation for the call of what we may designate an Inter-American Convention of Sanitary Coordination for the purpose of considering all points brought out in this agenda and the means for implementing an efficient public health policy throughout the hemisphere.

3. It is recommended that the Association undertake an extension of its charter in the form of a branch inclusive of those regions or states in this hemisphere not already comprised within the area of the A.P.H.A.

4. It is recommended that steps be taken in order to secure the organization of all health departments in such a way that they shall be technically staffed in the various public health specialties and in order that they may be able to intervene in the protection of water supplies, both in cities and rural work centers, and in the promotion of immunization.

Finally, for me to draw in panoramic scope the future of public health in the American continents is an enterprise beyond my strength. Nevertheless, I have endeavored to develop the theme, moved by enthusiasm and faith in our common comprehension and our common need and with a belief in the real fraternity of the people of our hemisphere. Those of us who, in one way or another, participate in public health work in our respective countries are bound to offer our full coöperation in this work of collaboration in order that we may firmly establish those ideals so well set forth in the Atlantic Charter.

Nation-wide Victory Corps—Physical Fitness Dental Program*

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WORKERS in the school health specialties have been efficiently performing an important job in dental health for many years. Since the early 1900's, school health personnel has taken the initiative in stimulating dental care among children. While the foregoing is a matter of record, the important fact has been generally overlooked that the interest in the dental health of school children on the part of school health workers, both in the public health and education departments, actually antedates present-day activities in this field of the dental profession itself.

A classic example of the initiative taken by educators in inaugurating dental care among school children is that of Willis A. Sutton, who as a public school principal of Atlanta, Ga., in 1909, interested himself in dental care for school children and succeeded in obtaining the aid of dentists in Atlanta in this work. Later, when Sutton became Superintendent of Schools of Atlanta, he instituted regularly conducted mouth hygiene periods for the children of that city. Such interest in dental health is quite common today, but was an unheard of innovation in this country thirty-five years ago.

It has been aptly pointed out that the dentist is just as much afraid of the child as the child is of the dentist. Time was when many dentists were reluctant to treat child patients and some even boasted that they "have nothing to do with children." Those days, fortunately, are now a thing of the past. It is the exceptional child whose fear of the dentist is such as actually to keep him from receiving dental treatment. Whatever reasons exist for the lack of dental care among some of our school population, fear of the dentist is certainly not one of primarily consideration. It is the school health worker, who largely deserves the credit for this change of attitude in the child with relation to the dentist.

However, despite the progress made, the disturbing fact remains that dental defects as a cause for rejection from military service were all but abolished by Selective Service authorities in order to prevent the wholesale disqualification of selectees. This is a clear indication that the amount of dental care received by children of a few years ago was woefully inadequate.

With the virtual removal of dental standards as a cause of rejection from military service and the acceptance of hundreds of thousands of dental cripples

* Presented at a Joint Session of the American School Health Association, and the School Health Section and Oral Health Group of the American Public Health Association at the Seventy-second Annual Meeting in New York, N. Y., October 14, 1943.

by the armed forces, dentists serving with the Army and Navy and other branches of our military and naval units are now faced with the Herculean task of treating dental disease, filling teeth, and constructing artificial dentures for the young men whose dental defects Selective Service has been forced to ignore and who have been accepted for military service. This work, it should be remembered, is in addition to the routine service needed to care for the usual dental ills that arise among the uniformed forces and the treatment of dental and oral conditions in those wounded in actual combat.

A large number of dentists have been inducted into the military services to perform this job. At the same time, the demands on the services of the civilian dentists have increased with the rise in general and war industrial employment which has made it possible for more people to afford dental treatment.

The boys and girls of our country who are too young for military service are now in danger of experiencing even greater dental neglect than heretofore for a number of reasons, foremost of which is the depletion of dental personnel in civilian practice by the induction of almost 30 per cent of the practising dentists into the armed forces.

With dentists in civilian practice largely occupied in treating adults, there is again the danger that dental treatment of child patients may be deferred or entirely ignored, repeating the vicious circle of dental neglect as it was revealed in the physical examinations of draftees.

In order to prevent the repetition of dental neglect of school children, the U. S. Office of Education, the U. S. Public Health Service, and the American Dental Association, have united their efforts in sponsoring a nation-wide dental program designed to reduce this health hazard among high school boys and girls, especially those in the upper grades, most of whom are shortly to enter the armed forces or war industries. It is hoped that these boys and girls will be made dentally fit before they actually leave school. This program which has already been launched is correlated with the correction of physical defects phases of the Victory Corps and Physical Fitness programs operating in high schools throughout the nation. It is planned to continue the program for the duration.

Through official channels, Dr. J. Ben Robinson, President, American Dental Association; Commissioner John W. Studebaker, U. S. Office of Education, and Dr. Thomas Parran, Surgeon General, U. S. Public Health Service, have requested dental, educational, and health officials throughout the nation to carry out their specific activities in the execution of this nation-wide dental program.

The coördination, implementation, and execution of the program on the national level has been delegated to the Victory Corps-Physical Fitness Dental Program Committee of the American Dental Association, which is composed of representatives of national dental, educational, and health groups. This committee of which Dr. Leon R. Kramer of Topeka, Kansas, is chairman, is supported and assisted by the Council on Dental Health of the American Dental Association, headed by Dr. Emory Morris of Battle Creek, Mich.

As pointed out by Dr. Morris, "The Victory Corps proposal contains no provision for assuring dental care for all population groups. However, this program should and will reach a large majority of high school students. There exist today at the state and local levels many facilities and considerable means that can be drawn upon and utilized to assist those who are unable to work out their own economic problem."

Defense, welfare, patriotic and other groups interested in the health of the youth have been invited to assist in the promotion of the program.

As a special contribution to the war effort, the American Dental Association has requested dentists in every locality to give "priority rating" and special consideration to the dental needs of high school students. This consideration is especially recommended to be given students who will soon be absorbed into the armed forces or war industry.

Letters explaining the program have been mailed from the U. S. Office of Education, in September of this year, to all state superintendents of public instruction, who are requested in turn to inform all high school principals in the nation.

Reports from dental officials indicate that approximately 40 states and the District of Columbia are now participating in the Victory Corps-Physical Fitness Dental Program which is designed to function under either the Victory Corps or other types of physical fitness programs operating in high schools in this country.

The Council on Dental Health has urged dental and school officials in every state to make some provision to carry out the intent of the program along the following lines:

1. On the state level enlist the coördinated efforts of the state department of public instruction, the state dental organization, and the state department of health. In most instances, the director of the dental division in the state board of health will be the administrator of the program.

2. State superintendents of public instruction are informed concerning the state dental society's willingness to aid school officials to carry out the dental corrective phases of their physical fitness programs.

3. The state superintendent of public instruction notifies through his bulletin or a circular letter, school officials in the state in regard to the dental society's willingness to coöperate.

On the local level the program can be carried out through the joint efforts of local high school officials, local dentists, and public health personnel.

Physical education teachers, science teachers, home room teachers, school nurses, and other qualified health personnel may participate as follows:

1. Distribute dental health forms and other material.

2. Keep records of dental health forms distributed to and returned by students.

3. Keep a record of the progress and results of the program.

It is important that *some one person* in the high school be made responsible for this program.

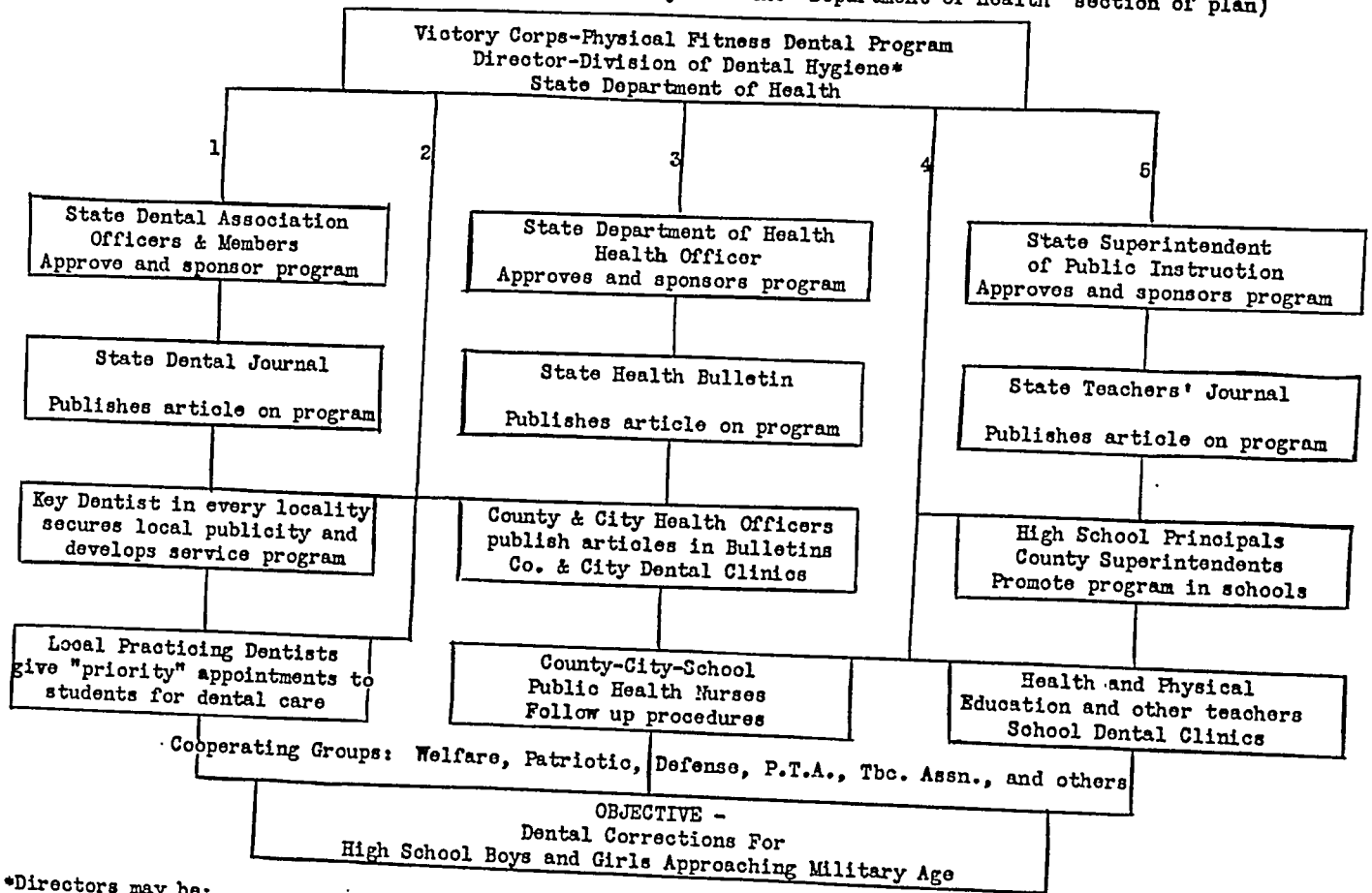
Dental posters, dental education folders, and dental report cards for students, classroom record blanks for teachers, and other materials needed for conducting the local program, in many states, may be obtained from the dental health division of the state department of public health. Educational material in the form of posters, leaflets, and dental health forms, films and other materials are also available at small cost from the Bureau of Public Relations of the American Dental Association, 222 East Superior Street, Chicago, Ill. It is suggested that local school officials and dentists develop the program to suit local conditions.

Possible sources of financial assistance include, the state or city boards of health, state or city departments of education, and state or city dental societies.

To start the program it is suggested that an announcement be made to the pupils describing the objective of the program as for example, in the form of "A Challenge to High School Students." * On the same day dental posters may be placed on bulletin boards and the distribution of dental

* See appendix.

FLOW DIAGRAM OF ORGANIZATION AND PROCEDURES FOR VICTORY CORPS AND PHYSICAL FITNESS DENTAL PROGRAMS
(States that have no dental health director may omit the "Department of Health" section of plan)



*Directors may be:
State Dental Director
Chm. State Dental Committee
H.S. Supervisor-Office of State Supt.

Council on Dental Health

1-3-5-Secure approval, use of publicity and organization facilities of state dental, health and teaching organizations.

2-4-Director sends instructions, local publicity, posters, dental forms, etc., through official channels to groups indicated on local levels.

American Dental Association

folders and dental health forms to the pupils is begun.

It is suggested also that, in coöperation with the local dentists, school officials develop a plan whereby pupils can receive dental examination and treatment. If dental health forms are used, they should not be given to all the pupils at one time as this would congest dental offices. The Health Committee of the Parent-Teacher Association, the School Health Council, and other organizations interested in school and community health should be invited to coöperate in the program.

The official class teacher should record the names of the pupils to whom dental health forms are given, the date they are distributed, and the date they are returned with the dentist's signature, indicating that dental corrections have been completed.

Dental inspections may be made in the offices of private dentists or in the schools in accordance with a plan mutually agreed upon by the school authorities and the local dentists.

Dental appointments: With proper safeguards, pupils should be permitted to fill dental appointments during school hours if required by the dentist.

The teacher and school nurse should frequently emphasize the importance of obtaining needed dental service and urge each student to have corrections made. Students in low income groups should be urged to pay for their own dental services by doing odd jobs outside of school hours.

At regular intervals after dental health forms have been distributed to the pupils, persons in charge of the local school program should check the results to ascertain the number of students who have obtained needed dental service.

School officials may wish to set up the objectives of this program as an achievement device in physical fitness.

Dentists engaged in administering dental health programs realize fully that school health workers constitute the backbone of the dental program for school children. Without the educational and follow-up aid of school and other public health workers, the result obtained in the way of corrections would be extremely low. This was demonstrated in a survey conducted some few years ago by the American Child Health Association which found that in the absence of a sustained educational and follow-up service children with dental defects showed the low average of only 2 per cent corrections. These findings are a far cry from the many 100 per cent corrections so frequently reported today. Perfect scores in dental care are not possible without the active support of the school health workers. The dental profession knows fully the importance of the school health worker in dental health.

APPENDIX

A Challenge to High School Pupils

Will you be able to fulfil your duties as a citizen when you become of military age? Will you want to join the Air-Corps, the Navy, the Marines, the Coast Guard, the Army, the Nurses' Corps, the Nurse-Aids, the WAC or WAVES? Will you eventually want a job in an industry that demands good physical condition and appearance of its employees?

If you do, you boys and girls in high school should start right now to have correctable physical defects corrected.

Dental disease and sight defects accounted for about 35 per cent of all rejections for service in the Army. Virtually all rejections charged to dental defects can be avoided if corrections are made in pupils of high school age. Many of the eye defects can be minimized by treatment, or by the proper fitting of glasses. If there is any doubt in your minds relative to your physical status, consult your dentist and physician at the earliest possible time.

Remember, you have but one set of permanent teeth, one pair of eyes, one pair of ears, feet, and hands. You have but one body, to serve a lifetime. If you abuse, neglect, or

wreck a car, it can be replaced. If you neglect to make early repairs of defects in your body when they become evident, if you abuse or wreck this body of yours, you may not only have cause for regret the rest of your life, but also you may be unable to procure a job in the field of your choice.

Are you going to be one of the thousands of young persons who, in the prime of life, cannot fulfil all the duties of citizenship because they neglected to make timely correction of physical defects?

What you do about correcting dental, eye, and other defects now, is your answer to this challenge: your answer to yourself, to your government and to your future dependents.

War Manpower Commission Extends Coverage To Include Health Workers

Physicians, dentists, veterinarians, sanitary engineers, and nurses who are salaried employees in essential or locally needed activities are hereafter subject to the same provisions of any employment stabilization program which applies to other workers in such activities, the War Manpower Commission announced. Such professional employees may not change their jobs without getting statements of availability from the United States Employment Service, or being referred to new jobs by the USES. The USES, however, it was emphasized, will make referrals of such employees only after consulting the state chairman of the Procurement and Assignment Service. This procedure, it was explained, will insure referral of these professional workers to jobs where they can make their most effective contributions to the war effort. Upon approval of the Regional War Manpower Director, any state director may delegate the duty of referring such employees to new jobs to the state and local offices of the Procurement and Assignment Service.

Post-War Implications of Fluorine and Dental Health*

Epidemiological Aspects

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THE prime problem of modern dentistry is the control of dental caries. Among civilized people few escape its attack, generally not one tooth but many being affected. As dental enamel once injured is incapable of self repair, carious defects and their sequelae accumulate at a rapid rate. If the next generation is to avoid a dental condition similar to that revealed by Selective Service figures [1] effective means of mass control, markedly inhibiting the high attack rate now characteristic of this condition, are essential.

For the treatment of the teeth and their surrounding structures there is in this country an autonomous profession of about 70,000 dental practitioners. During 1941 about $500,000,000 was spent for dental services in the United States.[2] As the major portion of a dentist's time is devoted to repairing either the ravages of dental caries or its numerous sequelae, the expanding economic, social and hygienic aspects of this problem are apparent. And, despite this large expenditure of time and money, the needs of only a portion of the population were met, the majority of the people receiving either no dental service or merely extractions. In so far as the general population is concerned there has seemed no practical means of handling this load with existing professional facilities and knowledge.

The first step in meeting this vast problem of dental needs lies in drastically reducing the incidence of dental caries in the population of the future. The recent epidemiological studies of dental caries experience associated with the use of fluoride domestic waters whose concentration is between 0.0 and 1.0 p.p.m. have opened up a hopeful potentiality undreamed of a few years ago. Concurrent studies in bacteriology, biochemistry, and animal experimentation lend further support to this hypothesis. Today much accumulated evidence indicates that small amounts of fluoride may be essential for optimal dental health. This paper will very briefly † present some of the epidemiological evidence pointing to the possibility of partially controlling dental caries attack by means of low fluorination of the common water supply.

1937–1939 PERIOD

In any history of the fluorine-dental caries relationship, the 1937–1939 period will be conspicuous. During this period a number of studies in epi-

* Presented before the Oral Health Group of the American Public Health Association at the Seventy-second Annual Meeting in New York, N. Y., October 14, 1943.

† For a more complete review of this subject, see reference 3.

demiology, bacteriology, biochemistry, and animal experimentation were reported. Noteworthy was the fact that the findings of these studies from independent investigators working in different institutions were each in general harmony with the findings of others. Briefly these studies were:

Epidemiology—In 1938 Dean reported [4] that among school children residing in areas of endemic dental fluorosis there was a very noticeably increased freedom from dental caries when the group was compared with a similar group living in a nearby non-endemic area. This increased freedom from dental caries was *operative whether or not the teeth were affected by mottled enamel.*

A short time later a study specifically designed to test this hypothesis was made by Dean, Jay, Arnold, McClure, and Elvove,[5] the groups studied consisting of 885 12–14 year old white children of four Illinois cities. Observations were limited to those children with continuity of risk of exposure to the variable being studied, the water supply. Attempts were made to equalize variables such as age, sex, color, and diet by sampling methodology; sunlight intensity by location of the cities studied. Two Illinois cities (Galesburg and Monmouth) using domestic water supplies containing 1.8 and 1.7 p.p.m. of fluoride (F) showed similarly low dental caries experience, 201 and 205 per 100 children examined, respectively. Two nearby cities (Macomb and Quincy) using water supplies containing 0.2 and 0.1 p.p.m. of fluoride (F), respectively, showed dental caries experience rates double and triple those observed at Galesburg and Monmouth. Epidemiological aspects of oral *Lactobacillus acidophilus* in the saliva closely reflected the observed differences in the dental caries rates between Galesburg and Quincy. The quantity of amylase secreted in the saliva and the amount of fluorine in pooled samples of saliva [6] disclosed no group population differences between Galesburg and Quincy. From an epidemiological standpoint it was difficult to ascribe these marked group differences to any cause other than the common water supply.

Biochemistry — Until results were presented by Armstrong,[7] and Armstrong and Brekhus,[8] in 1937 and 1938, with respect to the fluorine content of human enamel and dentine, there was no certain evidence of any relationship between the chemical composition of enamel and dentine and the tooth's liability to dental caries. These workers found that between sound and carious teeth there was no compositional difference in the major components, calcium, phosphorus, magnesium, and carbonate. A significant difference, however, was noted in the fluoride content. According to these workers the enamel of sound teeth has a mean fluoride content of 0.0111 ± 0.00203 per cent fluorine, while enamel of carious teeth contained 0.0069 ± 0.00111 per cent fluorine. Dentin showed less striking difference; dentin of sound teeth equaled 0.0169 per cent fluorine as compared with carious teeth dentin which contained 0.0158 per cent fluorine.

Animal experiments — In 1938 Miller [9] showed rather strikingly that induced rat caries may be largely prevented by additions of sodium fluoride, or calcium fluoride, or iodoacetic acid to the rat's food and water. Thus it was demonstrated for the first time that it is possible to inhibit induced caries in rats by means of two substances noted for their antienzymatic properties. Miller's results with respect to fluorides were confirmed by Finn and Hodge [10] and by numerous workers since. In connection with this experiment of Miller's, Harrison [11] reported certain bacteriological studies concerning the oral flora of the rats. He found a

temporary reduction of lactobacilli from 18 per cent to 3 per cent and 1 per cent in terms of the total acidogenic organisms associated with the iodoacetic acid and fluoride feeding, respectively. Another pertinent study at this time was that of Hodge, Luce-Clausen, and Brown [12] indicating that the interpretation of Lilly's results [13] marked reduction in rat caries on a casein diet, might be explained on the basis of possible contamination of the commercial casein with fluoride.

Late in 1939 Cox and his associates [14] reported an interesting experiment which suggested that caries resistance could be "built into the enamel." The offspring of rats fed sodium fluoride, submottling dosage, during gestation and lactation showed significantly less caries than the offspring of animals not fed sodium fluoride. In this experiment, these workers point out, the fluorides apparently reached the young animals through physiological routes, placental and mammary transmission. No fluorine was given to the rats after their teeth erupted.

General—Much work on various phases of this problem have been reported since 1939, the interested reader being especially referred to the monograph, *Fluorine and Dental Health*.[15] The mechanism by which fluoride inhibits dental caries still provides a fruitful field for discussion and investigation, recent studies by Armstrong [16] and McClure [17] indicating that the mode of action may follow one of several paths.

A STUDY OF 21 CITIES IN 4 STATES

The marked variation in dental caries prevalence between the white urban school populations of Galesburg and Quincy (Ill.) furnished a thorough example of a naturally occurring phenomenon. The evidence in this and other studies pointed presumptively to fluoride as the inhibitory agent. The next step, then, was intentionally to expose this natural phenomenon to various kinds of verification; the soundness of this hypothesis would be in direct proportion to the degree of variation found in selected epidemiological and planned experimental studies. For the purpose of experimentally verifying this hypothesis a relatively extensive epidemiological study was planned:

1. To check this phenomenon in respect to other relations and in a large number of cases over a wide and varied range of circumstances.

2. To determine whether or not there were domestic waters low enough in fluorides to eliminate the problem of mottled enamel but still sufficiently high in fluorides to reduce markedly the incidence of dental caries.

The study [18, 19] as finally constituted comprised 21 cities: 8 in the suburban Chicago area (Elmhurst, Maywood, Aurora, Joliet, Elgin, Evanston, Oak Park, and Waukegan, (Ill.); Kewanee, (Ill.); Zanesville, Portsmouth, Middletown, Marion, and Lima, (Ohio); Elkhart and Michigan City, (Ind.); Colorado Springs and Pueblo, (Colo.); and Quincy, Galesburg, and East Moline, (Ill.).

Some of the more important technical methods utilized in the measurement and observation of this phenomenon were:

Age, sex, and color—All examinations were limited to 12–14 year old white school children with relatively equitable sex distribution in the groups. The reason for selecting this age group is set forth in the original articles.[5, 18]

Selection of study groups—Essentially all 12, 13, and 14 year old white public school children continuously exposed throughout life to the variable under investigation (the public water supply) were examined. To study effectively differences in dental caries experience in relationship to the mineral composition of the public water supply,

TABLE 1

Summary of Dental Caries Findings in 7,257 Selected White School Children, Age 12–14 Years, of 21 cities of 4 States in Relation to the Fluoride Content of the Public Water Supply

		Clinical						Water (in p.p.m.)		
		Dental Caries Experience, Permanent Teeth			Bacteriology					
City and State	Number Children Examined	Per cent Children Showing None	per 100 Children Examined	Prox. Surf. Sup. Incis. per 100 Surfaces	Per cent with L. Acidoph. Counts: Neg and <100	Per cent with L. Acidoph. Counts: 30,000 and >	Index * of Dental Fluorosis	Mean Annual Fluoride Content	Total Hardness	Source
Galesburg, Ill.	273	27.8	236	0.46			0.69	1.9	247	Deep wells
Colo. Springs, Colo.	404	28.5	246	0.31			1.3	2.6	27	Surface (Pike's Peak)
Elmhurst, Ill.	170	25.3	252	0.60	35.7	24.7	0.67	1.8	323	Deep well
Maywood, Ill.	171	29.8	258	0.59	39.6	20.9	0.51	1.2 †	75	Deep wells
Aurora, Ill.	633	23.5	281	0.78	38.2	25.6	0.32	1.2	329	" "
East Moline, Ill.	152	20.4	303	0.16			0.49	1.2	276	" "
Joliet, Ill.	447	18.3	323	1.30	35.6	26.6	0.46	1.3	349	" "
Kewanee, Ill.	123	17.9	343	1.40			0.31	0.9	445	" "
Pueblo, Colo.	614	10.6	412	0.47			0.17	0.6	302	Arkansas River
Elgin, Ill.	403	11.4	444	4.1	21.2	33.2	0.22	0.5	103	Deep wells
Marion, Ohio	263	5.7	556	3.3			0.25	0.4	209	" "
Lima, Ohio	454	2.2	652	3.2			0.09	0.3	223	Surface (impounded)
Evanston, Ill.	256	3.9	673	10.7	15.4	41.8	0.05	0.0	131	Lake Michigan
Middletown, Ohio	370	1.9	703	7.1			0.09	0.2	329	Deep & shallow wells
Quincy, Ill.	330	2.4	706	11.2			0.04	0.1	88	Mississippi River
Oak Park, Ill.	329	4.3	722	9.0	18.2	43.8	0.05	0.0	132	Lake Michigan
Zanesville, Ohio	459	2.6	733	11.4			0.08	0.2	291	Deep wells
Portmouth, Ohio	469	1.3	772	10.4			0.06	0.1	80	Ohio River
Waukegan, Ill.	423	3.1	810	17.7	14.9	54.6	0.01	0.0	134	Lake Michigan
Elkhart, Ind.	278	1.4	823	11.2			0.05	0.1	220	Deep wells
Michigan City, Ind.	236	0.0	1,037	18.0			0.01	0.1	141	Lake Michigan

* For method of computing community index of dental fluorosis, see reference 15. Indexes of 0.0–0.4 (negative) and 0.4–0.6 (border line) are of little or no public health significance with respect to the development of endemic dental fluorosis (mottled enamel); in communities showing indexes of 0.6 or more removal of excessive fluorides from the water supply is recommended.

† A few years prior to survey, Maywood water probably contained 1.4–1.6 p.p.m. of fluoride (F). (Data compiled from: *Pub. Health Rep.*, 56:761 (Apr. 11), 1941 and 57:1155 (Aug. 7), 1942.)

it is necessary to eliminate the influence of population movements. Dental caries being a non-healing lesion, a single clinical examination of 12–14 year old children can merely record the amount of dental caries experienced during the post-eruptive life of the tooth examined. At what particular time during post-eruptive tooth life the observed lesion developed cannot be determined on the basis of a single examination in this age group. In order, therefore, that the observed carious conditions might be properly classified according to one or another particular water supply, only children continuously using the water under investigation were studied. Otherwise, dental caries developed several years previously in a high rate area might be erroneously charged to a low rate area, or vice versa. Needless to say, there should be no relevant changes in the physical set-up, source, or composition of the water supply during the period concomitant with the life of the group examined.

Clinical examinations—All examinations were made with the aid of a mouth mirror and explorers by one or the other of two commissioned dental officers of the Service. The examination schedules were numbered serially and in each city all odd numbered cases were examined by one examiner, all even numbered by the other.

Dental caries experience (or prevalence) rate—A rate reasonably defined as a measure of the caries experience of a population in these age ranges may be calculated by summing the mutually exclusive numbers of permanent teeth * in each mouth associated with past or present dental caries: (past dental caries) *a.* filled teeth, *b.* missing teeth, and (present dental caries), *c.* teeth with untreated dental caries, *d.* teeth indicated for extraction.

* Third molars excluded

FINDINGS

The basic findings from the study of these 21 cities are summarized in Table 1 and Figure 1. The striking variation in the intensity of dental caries attack as evidenced by the marked differences in the amount of dental caries experience among these white urban school populations is probably the outstanding epidemiological characteristic of these data. Considering the homogeneity of these populations, the method of selecting the groups studied, and the comparability of the clinical measurement standards used, it is difficult from an epidemiological standpoint to ascribe these differences to other than the mineral composition of the public water supply.

On the basis of the order of epidemiological events and knowledge from laboratory studies one seems justified in inferring that the inhibitory agent is the fluoride present in the water supply. An inspection of the range of different fluoride concentration discloses an inverse relation in general between the amount of dental caries and the fluoride concentration of the com-

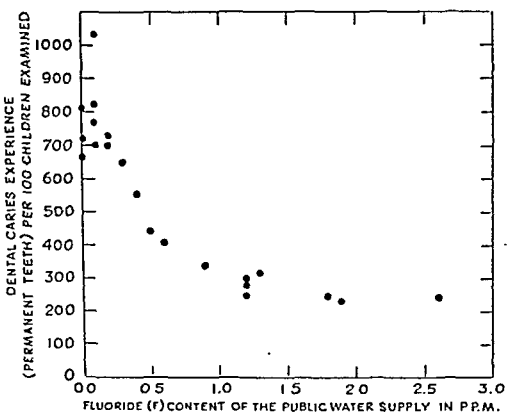


FIGURE 1—Relation between the Amount of Dental Caries (permanent teeth) Observed in 7,257 Selected 12–14 Year Old White School Children of 21 Cities of 4 States and the Fluoride (F) Content of the Public Water Supply *

* From Dean, H. T., Arnold, F. A., Jr., and Elvove, E. *Pub. Health Rep.*, 57:1155 (Aug. 7), 1942.

mon water supply. Relatively low dental caries experience rates are found associated with the use of domestic waters whose fluoride (F) concentrations have a range of 1 or more p.p.m. Intermediately, e.g., at concentrations 0.9 to 0.5 p.p.m., the influence is less marked than at the higher concentrations; nevertheless, the dental caries experience rates are distinctly lower than those associated with the use of the relatively fluoride-free waters.

Differences in dental caries experience rates of as much as 2 and 3 times the observed minimal were not unusual; the highest rate, 1,037, at Michigan City (Ind.) was 4.4 times that observed in the city with the lowest rate, 236, at Galesburg (Ill.). Strikingly low dental caries prevalence was found associated with the continuous use of domestic waters whose fluoride (F) content was as low as about 1 p.p.m., a concentration which under the conditions prevailing in the localities studied produced only sporadic instances of the mildest form of dental fluorosis of no esthetic or known public health significance.[18]

In interpreting broad epidemiological studies of this nature it is essential that the single association (in this case, fluorine and dental caries) be checked with respect to its relation to other associations, both by detailed local studies and by experimental investigations. Many chemical, bacteriological, experimental studies reviewed in the monograph *Fluorine and Dental Health* together with subsequent reports in the literature in these and other coördinative fields established the relationship of fluorine to dental caries.

Analysis of detailed local studies in this series indicate that the marked differences in dental caries experience observed in the 21 cities studied are not explainable on the basis of hours of sunshine, gross dissimilarities in the diet (water excluded), or hardness of the water supply. A brief discussion of these three variables follows:

Amount of sunshine—Certain broad studies[20, 21] have suggested an inverse relationship between the amount of sunshine and the dental caries prevalence; neither of these studies takes into account the influence of the fluoride intake variable. In this study of 21 cities there are two instances that warrant comment. First, in the Chicago suburban area, Maywood and Oak Park are within a one mile radius with sunshine apparently comparable. Yet, Oak Park using the fluoride-free Lake Michigan water shows a dental caries rate nearly 3 times as high as Maywood using a water slightly in excess of 1 p.p.m. Again, Portsmouth and Middletown (Ohio), cities characterized by high dental caries experience, show percentages of "clear days" as high or higher than that of Galesburg where a very low dental caries prevalence was observed. Parenthetically it might also be noted that some communities having an abundant amount of sunshine are also characterized by high dental caries prevalence, e.g., Key West (Fla.) [22] where the inhabitants obtain their domestic water from cisterns, Haiti,[23] Jamaica,[24] and Panama Canal Zone.[25]

Diet—With respect to diet it seems reasonable to assume, especially in the Chicago suburban area, that the food habitually consumed by the populations follows a general likeness. Hence considering the selection method used (all children of continuous residence in each community), it would seem unlikely that the marked differences in dental caries experience were due to differences in the food used in the communities. It would not seem reasonable to assume that the dietary regime (water excluded) of the 633 Aurora children was sufficiently different from that of the 423 Waukegan children to account for a difference in dental caries experience

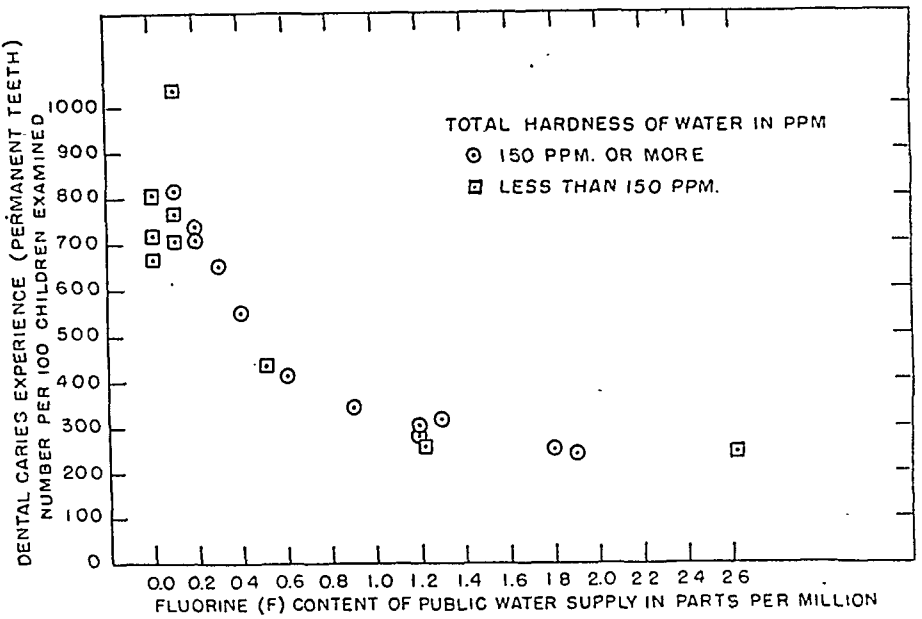


FIGURE 2—Variation in Dental Caries Experience Rates Observed in 7,257 Selected White School Children, Aged 12–14 Years in 21 Cities of 4 States with Fluoride Concentration of the Public Water Supply according to High and Low Values of Total Hardness

rates of nearly 3 times (281 in Aurora and 810 in Waukegan).

Hardness of water—From time to time [20, 26–29] there has been reported in the literature an inverse relation between hardness of the drinking water and dental caries prevalence. These studies, in general, indicated that, when relatively large numbers of cities were studied, users of " hard " water had less dental decay than those using " soft " waters. Most of these studies were reported before the influence of fluoride was known. In the light of these new findings it is necessary to reëxamine the old " hard " water-dental caries studies because of the likelihood that the differences in the reported amount of dental caries were due to differences in the amount of fluorides and not to differences in hardness of water. Small amounts of fluorides are most frequently found in ground waters, surface supplies being as a rule relatively free. Thus, if we compare the waters of a relatively large number of cities selected at random we are very apt to have most of the higher fluoride waters in the " hard " water group and most of the lower fluoride or " fluoride-free " waters in the soft water group.

Analysis of the data from the 21 cities studied, particularly with reference to specific communities, indicates that the observed differences in dental caries experience is not explainable on the basis of water hardness. For example, in this study, Middletown and Zanesville (Ohio) having relatively high hard water supplies (329 and 291 p.p.m., respectively) but practically free of fluorides show high dental caries prevalence rates of 703 and 733, respectively. On the other hand, the unusually " soft " water supply of Colorado Springs (Colo.) (hardness, 27 p.p.m.) contains 2.6 p.p.m. of fluoride (F). Examination of 404 children in this city showed a very low dental caries experience, 246 per 100 children examined.

Certain data reported in Table 1 for the 21 cities studied are shown in Figure 2, dental caries prevalence being

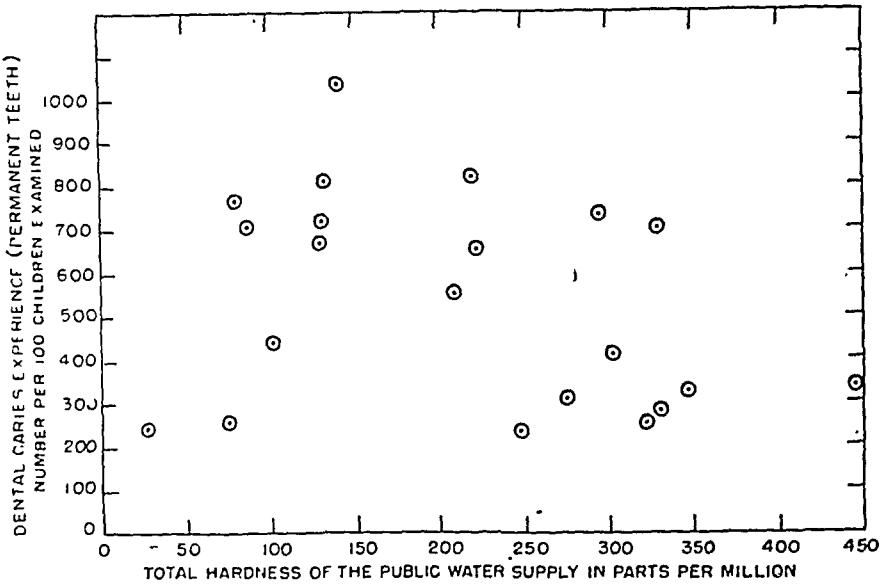


FIGURE 3—Variation in Dental Caries Experience Rates Observed in 7,257 Selected White School Children Aged 12–14 Years, in 21 Cities of 4 States with the Total Hardness of Public Water Supply

plotted against the fluoride concentration of the public water supply with the cities divided on the basis of water supplies under and over 150 p.p.m. of hardness. No tendency of these points to distribute themselves on the basis of hardness is discernible. To analyze these data another way the dental caries experience was plotted against the total hardness of the water supply. As may be seen in Figure 3, the plotted points are scattered at random suggestive of a very poor or nonexistent relationship. When, however, these same

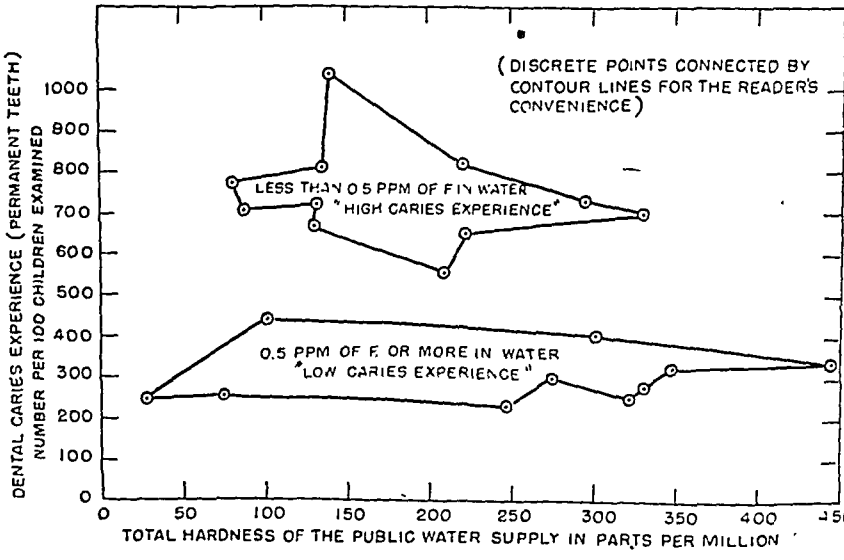


FIGURE 4—Variation in Dental Caries Experience Rates Observed in 7,257 Selected White School Children, Aged 12–14 Years in 21 Cities of 4 States with the Total Hardness of the Public Water Supply according to the High and Low Fluoride Values

discrete points are connected with contour lines on the basis of whether the water contains more or less than 0.5 p.p.m. of the fluoride (F) (Figure 4) the separation and parallelism is unmistakable.

In short, these data when subjected to quantitative inductive inspection show that the fluoride factor cannot be changed in quantity without affecting the phenomenon (dental caries prevalence); fluoride seemingly constitutes an indispensable condition of this particular phenomenon. On the other hand, wide quantitative variations in another factor (hardness) may occur without noticeably influencing the phenomenon, suggestive of an association without causal connection.

DISCUSSION

From the standpoint of control measures the basic finding of this study is the relationship between fluoride domestic waters in the 0.0–1.0 p.p.m. concentration range and the prevalence of dental caries. There seemingly is little if any advantage to be gained in further caries reduction by using a water higher than about 1 p.p.m. And, as this concentration is sufficiently low to eliminate the complicating problem of dental fluorosis the question of markedly reducing the dental caries incidence through low fluorination of the domestic water supply warrants thoughtful consideration.

Theoretically the question of low fluorination of the domestic water supply for the control of dental caries would appear sound.* Because of its unusually high prevalence, dental caries seems particularly suited for control measures through a communal medium such as the water supply. The per capita cost would be low and the concentration necessary apparently harmless. In fact, there is the added security that a recommendation to bring the fluoride (F) content of a domestic water up to 1 p.p.m. would not involve adding anything new to waters not already present in water supplies now used by probably well over a million people in this country. Furthermore, the amount suggested is considerably lower than many hundreds of thousands of these people are now using daily.

Using the observations made on the 633 Aurora (Ill.) children as a basis of comparison with the 1,008 children examined at Evanston, Oak Park, and Waukegan, Arnold [30] has recently estimated the magnitude of the beneficial changes that might be expected to follow after the requisite lapse of time were the fluoride-free Lake Michigan water supplies used at Evanston, Oak Park, and Waukegan raised to about 1 p.p.m. of fluoride (F):

1. About six times as many children showing no dental caries experience (caries free)
2. About a 60 per cent lower dental caries experience rate
3. About a 75 per cent decrease in the first permanent molar loss
4. Approximately 95 per cent less caries on the proximal surfaces of the four superior permanent incisors

Much investigation work, however, is necessary before a recommendation can be given for its general application. *Before attempting to convert this observed natural phenomenon into one of general usefulness specifically planned epidemiological studies must clearly demonstrate the safety of low fluorination as it might relate to other aspects of the community's general health.*

Assuming that properly planned and sufficiently complete studies demonstrate the harmlessness of long continued use of waters of considerably higher fluoride concentration than 1

* For a discussion of certain philosophical considerations inherent in this suggestion, see: Wolman, A. What Are the Responsibilities of Public Water Supply Officials in the Correction of Dental Deficiencies. *J. Am. Water Works A.*, 35:1198–1200 (Sept.), 1943.

p.p.m. for effects other than teeth, it would seem that the next step would be a practical test of this hypothesis utilizing human populations. Two cities in the 40,000–50,000 population range obtaining fluoride-free water from the same source would be most desirable. A rigidly controlled study, in which the fluoride concentration of one city's water was brought up to 1 p.p.m. and the population of both cities born subsequent to the change kept under observation for a sufficient number of years would be necessary to demonstrate that the addition of that amount of fluoride to a fluoride-free water will actually reduce the amount of dental caries in the community.

Should this crucial experiment prove successful—a large amount of presumptive evidence is encouraging—domestic waters from the standpoint of the relation of fluoride to dental health might hereafter be classified into three groups:

1. Those carrying naturally the *optimal* concentration of fluoride (F) i.e., about 1 p.p.m., and would therefore require no treatment;

2. Those carrying an *excessive* concentration of fluoride requiring the removal of the excess in order to protect the community against endemic dental fluorosis (mottled enamel), or,

3. Those *deficient* in fluoride to which fluoride might be added to bring its concentration up to the optimal in order to inhibit dental caries attack.

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Caution Urged in Use of New Mold Called Patulin, for Common Cold

Caution in considering the efficacy of a new preparation for the common cold, called "patulin," is advised by the *Journal of the American Medical Association* for December 25. The *Journal* says in part:

"Recent reports from London describe work with a preparation called 'patulin' for the common cold. This substance is a metabolic product of penicillium patulum and has now been identified. . . ." Nearly 100 patients were treated and 85 untreated were observed as controls. "One of the patients showing dramatic improvement was Gye [one of the investigators] himself. A high proportion of the persons treated seemed to show recovery in a much more rapid and complete fashion than would have been expected without treatment. From this small sample the statistician Major Greenwood deduced that the results in the treated group would have been most unlikely to occur from pure chance alone. In the *Lancet* a week after publication of these reports appeared a communication from three investigators, headed by Stuart-Harris, which briefly records the results of giving patulin to 100 patients with the common cold and of not treating 100 alternate persons. The proportion of cases which showed clinical improvement was substantially the same in the two groups; the writers conclude that patulin had no demonstrable effect on the course of this series of colds as compared with the natural evolution of the disease. Pending the outcome of further studies, it would be unwise to view this new form of treatment of colds with too much optimism."

Post-War Implications of Fluorine and Dental Health*

The Problem as It Relates to the Water Works Engineer

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PROGRESS made in the investigation of the fluoride content of water supplies and its relation to dental decay is being followed with much interest by the water works profession since it appears probable that a whole new problem will be placed in their lap for solution. The problem, of course, concerns the reduction of dental decay by the application of sodium fluoride to fluorine deficient public water supplies, and concurrently the prevention of mottled enamel by the reduction of the fluoride content of those supplies that exceed the optimum amount.

The reduction of the fluoride content of a water supply to an optimum amount may be difficult and expensive. To my knowledge there are no public water supplies in the country now being treated for the reduction of fluorides. In water softened with lime, a certain reduction in fluorides is reported by Scott, Kimberly, Van Horn, Ey, and Waring,[1] and Elvove[2] reports successful removal of fluorides in laboratory experiments with the use of calcined magnesite and light magnesium oxide. Removal of fluorides from potable water by tricalcium phosphate has been reported by Adler, Klein, and Lindsay.[3] Wherever possible, the best solution to the mottled enamel problem still appears to be the changing of the source of supply to one that contains 1 p.p.m. or less of fluorides.

The application of sodium fluoride to fluorine deficient public water supplies for the reduction of dental decay should not prove a difficult problem. Many supplies are now being treated for the reduction of hardness, clarification, taste and odor control, disinfection, corrosion control, color removal, stability, etc., so that chemical feeding equipment and control measures are well established and widely used. Also, much of the personnel responsible for water quality and treatment is highly trained. It is obvious, therefore, that should a program for applying fluorides be established, those supplies now receiving treatment under local laboratory control would have little difficulty in applying an additional chemical. Most of these supplies would need only additional chemical feed equipment to establish the treatment.

Fortunately, there are many types of good, inexpensive chemical feed equipment on the market. For the smaller supplies there are available several makes of pumps which are calibrated for output and which are usually powered with an electric motor, but which may be powered with a water motor or a gasoline engine. They may be operated manually or automatically.

* Presented before the Oral Health Group of the American Public Health Association at the Seventy-second Annual Meeting in New York, N. Y., October 14, 1943.

The feed pumps are usually designed to apply the chemical solution to the water while it is being pumped, and at a place where the water is under pressure. This equipment is particularly suited to treat well water supplies, and especially those provided with deep well turbine pumps. The feed pumps are durable, accurate, and dependable. A single unit, which has a capacity adequate to treat a water supply with a daily average production of 1,000,000 gallons, costs installed approximately $250 to $350. One unit with a few spare parts should prove satisfactory with reasonable care for the treatment of a small supply for at least ten years.

Also available for the treatment of small supplies are gravity solution feeders which are adaptable for use where the point of chemical application is an open basin, such as at the inlet of a reservoir or to a pump suction. This equipment is accurate and equally inexpensive.

For the treatment of the larger supplies, equipment of the dry feed type is available and desirable. A choice between volumetric and gravimetric methods of measurement is also available. Dry feed equipment has been in service for many years, and is known to be dependable and accurate. Both small and large feeding equipment have an average accuracy within 5 per cent, which is greater than the accuracy of the test for fluorine in water.

The control of the application of sodium fluoride should not be confined to the accuracy of the feeding equipment, but should be dependent on the results of a test for fluorine in the treated water. Such a test should be simple in procedure, accurate to 0.1 p.p.m. of fluorine, and expeditious in results. A colorimetric test is needed with permanent standards that can be used by water plant operators having little or no technical education. A test kit similar to that used for determining residual chlorine would be desirable. Present test procedure as outlined in *Standard Methods of Water Analysis, Eighth Edition,* uses temporary color standards and requires 18 hours for the completion of the test. This test would, therefore, be unsuited for general application.

Until a new and simplified test with permanent color standards is available, the application of sodium fluoride to public water supplies should logically be limited to those supplies having local laboratory control by technically trained personnel.

It has been my experience with water supplies in Michigan that many of them contain small amounts of fluoride (F), usually varying from 0.1 to 0.5 p.p.m., and in a few cases, slightly higher amounts. Obviously if a water supply were to be treated with sodium fluoride to 1 p.p.m. or any other predetermined amount, the natural or residual amount in the untreated water must be known and taken into consideration when computing the chemical application. It is apparent, therefore, that before the fluoride treatment is established on any supply, one or more analyses for fluorine in the untreated water are essential. Otherwise there would be an excellent opportunity to overtreat the water which may be sufficient to cause mottled enamel.

An attractive feature of the fluoride treatment of water supplies is its small cost, which is partly due to the application of only 1 p.p.m., and partly to the low cost of sodium fluoride which is quoted at 7 cents per lb. Since commercial sodium floride is 90 per cent pure, an application of 1 p.p.m. of fluoride (F) would require 20.5 lb. for each million gallons of water treated. Applying these figures to a town with a population of 7,500 and using an average of 1,000,000 gallons of water each day, the total cost for the fluoride treatment for a full year would approxi-

mate $567. This figure includes the cost of the chemical, the chemical feeding equipment prorated over ten years, and the cost of a fluorine testing set, but does not include the cost of any labor, since no additional help would be required. On a per capita basis the annual cost of the treatment is about 7½ cents, and for a family of four the annual cost would approximate 30 cents.

It is indicated in survey data presented by Dean, Arnold, and Elvove [4] that the number of permanent teeth showing dental caries experience per 100 children examined, using water supplies with fluoride (F) concentrations between 1 and 1.4 p.p.m. was roughly 39 per cent of that found in children using water supplies containing fluoride (F) concentrations of less than 0.5 p.p.m. Likewise the findings for similar groups of children using water supplies containing fluoride (F) concentrations between 0.5 and 0.9 p.p.m. was roughly 54 per cent of that found in children using water supplies containing fluoride (F) concentrations of less than 0.5 p.p.m. From these data it could be concluded that approximately a 50 per cent reduction of dental caries in the permanent teeth of 12 to 14 year old white children is obtainable with the use of a water supply containing 1 p.p.m. of fluoride (F). This means that the annual dental bill for the restoration of decayed teeth in children of this age group can be cut in half. Of course, the fluoride treatment of water supplies means much more than this since all age groups will be benefited, but to what extent must first be determined before a complete cost analysis can be prepared.

Even though the benefits of the treatment are evident from a public health and a financial viewpoint, it is still prudent to consider the legal responsibilities that a town or private utility accepts when it establishes the fluoride treatment of a public water supply. With that thought in mind, Dr. H. Allen Moyer, Commissioner, Michigan Department of Health, asked the Attorney General of Michigan for an opinion on the following question:

> Could the owner (either a municipality or a private utility) of a public water supply be held liable for damages in the event that the supply was treated with fluorine and one or more customers developed mottled tooth enamel which they claimed disfigured their appearance or structurally weakened their teeth or made some similar complaint?

The Attorney General's opinion follows:

> The general rule of liability as to private utilities in furnishing water for public domestic use has been summarized as follows: "A water supply corporation is not an insurer of the purity of the water furnished by it for public consumption, or of its freedom from infection, but is bound to use reasonable care and diligence in producing pure and wholesome water that is at all times free from any infection or contamination which renders the water unsafe and dangerous to individuals, or unsuitable for domestic purposes, and is liable for injury resulting from its failure to do so."
>
> The same rule is generally held applicable to municipal corporations.
>
> Before liability could be established it would be necessary that the plaintiff show negligence on the part of the utility or municipality furnishing the water and show that his injuries resulted from such negligence.
>
> However, it is possible that liability could be established were it shown that through some negligence in treatment quantities in excess of one part per million were introduced from which damage resulted.

This opinion restates the responsibilities for which a water utility has always been accountable. In other words, the addition of fluoride to a supply does not increase or decrease those responsibilities. The opinion also emphasizes the need for a standard procedure for the control of the application of fluoride.

A request for an opinion on the following question was also made:

Assuming that the treatment was originally started for the benefit of the public health and admitting that the treatment of a public water supply with fluorine is mass therapy, could a local citizen who objected to the practice of treatment from a personal angle, but whose teeth were not damaged by the treatment, stop such treatment of the water supply?

In reply to this question the Attorney General's opinion was:

Assuming the authority of a municipality to add fluorine to its public water supplies, there would be no method by which a citizen not injured by but not sympathetic to the program could enjoin such treatment.

Finally, I believe it imperative that should the fluoride treatment of public water supplies be adopted that the state health departments should exercise supervisory control over the treatment in much the same manner now used in respect to the other types of treatment. Such control should include as a minimum, an annual inspection of all treatment plants by an engineer of the department, the submission of monthly reports on the operation of the water treatment plants to the health department, and, finally, and most important in my opinion, the establishment of a certification or licensing system which would insure competent and trained personnel to be in charge and responsible for the treatment wherever it is practised.

SUMMARY

The reduction of fluoride in a supply to an optimum amount for the prevention of mottled enamel may be difficult and expensive. Changing the source of water supply to one containing less fluoride still appears to be good practice.

Adding fluoride to fluorine deficient water supplies for the reduction of dental decay should not prove a difficult problem, since accurate, durable, and inexpensive chemical feed equipment is available. The supplies that are now under local laboratory control with technically trained personnel could institute the fluoride treatment with very little new equipment. A quick, accurate, and simple test for fluoride (F) having permanent color standards is needed, however, before the treatment should be approved for general application. The cost of the treatment is small, averaging about 7½ cents per person a year. Legally, the responsibility of a water utility applying fluoride to a supply remains unchanged. Negligence in treatment which results in damage must be shown to establish liability. Supervisory control of the treatment by state health departments is desirable.

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Meningococcal Carrier Studies*†

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THERE has been a marked increase in the incidence of meningococcal meningitis throughout the United States during the past two years. Morbidity reports indicate that the number of cases during 1942 was twice the 5 year median 1937–1941. For the first 30 weeks in 1943 its prevalence was about seven times the 5 year median 1938–1942 for the same period, and surpassed the number reported for the year 1929.[1-4] This increase in the number of cases at a time of national military and industrial mobilization has served to focus the attention of those concerned with the investigation and prevention of epidemic disease.

The mode of dissemination of cerebrospinal meningitis has been repeatedly investigated and reviewed.[5-11] The importance of the meningococcal carrier has been considered in all reports, although a direct correlation of carrier percentage to case incidence has been difficult to establish.[10] A carrier may be defined as an apparently healthy individual from whom the specific organism of a disease can be isolated. The intricacy of the problem is greatly augmented by the fact that no adequate means are available to assess the virulence of the causative organism or the protective responses of the host. Resort to the antigenic differentiation of meningococci, and their subdivision into specific groups as isolated from cases and carriers, has been a distinct aid epidemiologically. At present it is assumed, with many reservations, that those types isolated from cases are virulent.

The present survey was planned to investigate the nature of the meningococcal carrier state in respect to duration, intermittency, frequency, and specific types of organisms prevailing. In addition the influence of the administration of sulfonamides on the carrier state was observed [12-15] in the hope that an adequate and feasible means of controlling the carrier would result. The technics now available for culturing and typing the meningococcus furnish more complete data than those previously obtained.

SELECTION OF STUDY GROUPS

A medical service unit at a nearby Army camp was chosen. The group was fairly stable and had not been materially affected by large numbers of new arrivals or departures. No cases of meningitis had occurred in this detachment, minimizing the inclusion of

* Presented at a Joint Session of the Epidemiology and Laboratory Sections of the American Public Health Association at the Seventy-second Annual Meeting in New York, N. Y., October 13, 1943.

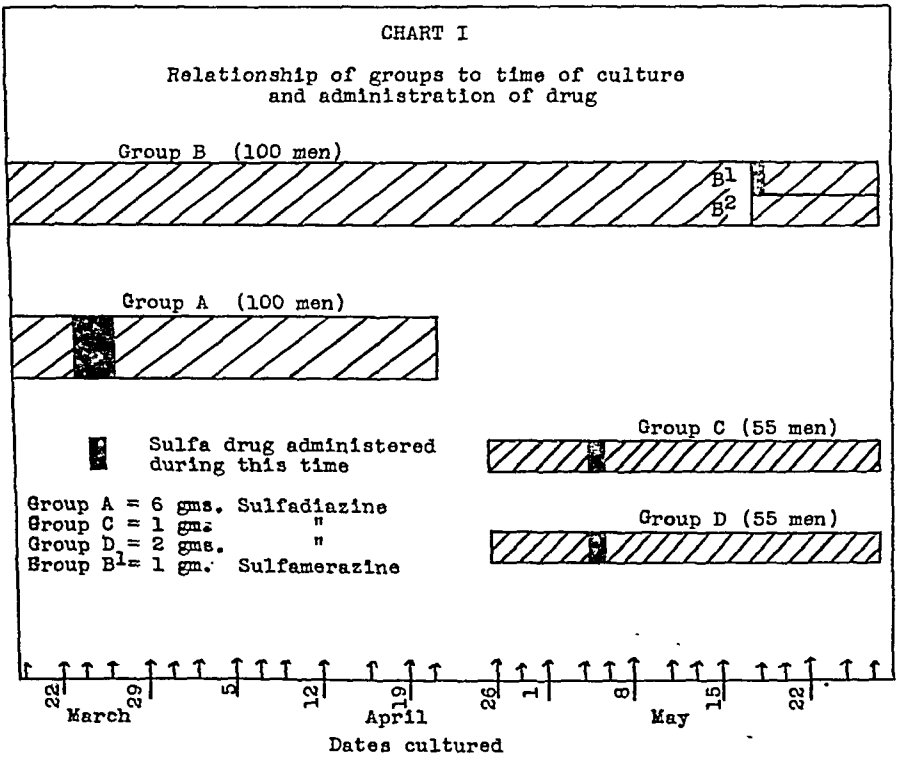
† These investigations were aided through the Commission on Meningococcal Meningitis, Board for the Investigation and Control of Influenza and Other Epidemic Diseases in the Army, Preventive Medicine Division, Office of the Surgeon General, United States Army.

" contact carriers " in the survey. The men in their duties formed a suitable sample of the camp as a whole. Some worked in offices as clerks, others were in the field as engineers and inspectors, while the remainder were assigned to special duties or served as ward men on the medical and surgical ward services. The medical ward men were not necessarily exposed to infectious diseases. A careful anamnesis was made of each individual, and all relevant data were assembled. Exposure to known cases of meningitis, medical past history, and recent sulfonamide therapy were specifically included. A record was also kept of the daily climatic variations and incidence of contagious disease at the camp for possible correlation with the rise and fall in carrier rate.

A group of 200 men were originally assigned to the study. One-half, selected at random, was chosen to act as a control (Group " B ") and to serve for study of the carrier state. The other half (Group "A") was cultured for a period of 1 week, and then 1 gm. of sulfadiazine was administered twice daily for 3 days to each man. About 1 month later this drug treated group was released and replaced by 110 new men, from the same service unit, for evaluation of smaller dosages (1 and 2 gm.) of sulfadiazine (Groups " C " and " D "). The original control group " B " was retained, except that during the last week of the study one-half of these men received 1 gm. of sulfamerazine. They were all cultured three times weekly throughout the period of the survey (Chart I).

CULTURAL TECHNIC

Nasopharyngeal swabs were inoculated directly upon warm 5 per cent rabbit blood agar plates containing para-aminobenzoic acid 5 mg. per cent. These were then carefully streaked and incubated under 6 per cent carbon



dioxide. Only type specific strains as revealed by agglutination in monovalent chicken sera [16] (Group I, Type IIa and Group II) are reported. Previous experience with over 1,000 cases of meningitis had shown that the type distribution of strains was: Group I, 92.9 per cent, Group II, 1.1 per cent, Type IIa, 5.8 per cent, Group IV, 0.0 per cent, Gonococcus, 0.1 per cent, and nontypable meningococci 0.1 per cent. Thus, only Group I, Type IIa, and Group II carriers were of epidemiologic importance. All cultures were taken by one member of the Meningitis Commission. Inspection of the plates, subculture, and agglutination were performed by members of the Commission, all of whom had long experience in the cultivation of the meningococcus.

A system of quantitative assay was adopted with due realization of the many inherent fallacies. All plates having up to five colonies were graded as 1 plus, and only a single colony was chosen for subculture and subsequent agglutination. If the colonies were dissimilar in appearance then one of each type was chosen. All cultures graded as 2 plus to 4 plus (more than 5 colonies to a pure culture of meningococci) had at least two separate colonies chosen for typing. If there were dissimilar colonies each of these was also picked. In this way false negatives were minimized and double infections frequently revealed.

Blood sulfonamide levels were made in all instances. A complete hematologic examination was performed on all those men receiving the drug for more than a single dose.

RESULTS

The results obtained may be presented in two parts. The studies on the carrier state comprise the first part and the changes in carrier percentage following the administration of the sulfonamide drugs the second.

The control group "B" was cultured at intervals of 2–3 days for a period of 68 days. Twenty-eight series of cultures were taken and each individual was cultured an average of 25 times. The results are summarized in Table 1. The total number of positive cultures was 1,030, or 41 per cent of all cultures made. Of these, 373 (14.8 per cent) were Group I; 240 (9.5 per cent) Type IIa; and 405 (16.2 per cent) Group II. There were twelve occasions in which agglutination occurred in both Type IIa and Group II sera and these have been recorded as Type II-IIa. The exact significance of this cross has not yet been evaluated as no absorptions were performed. All men carrying this type subsequently were found to carry a definite Type IIa or Group II.

TABLE 1

Carrier Survey, Control Group "B"

(99 individuals)

Result of Cultures	*Total*	*Per cent Total Cultures*	*No. of Men Positive*	*Average Times Each Positive*	*Per cent Group B Positive*
Positive cultures	1,030	41.0	91	11.1	91.0
Group I	373	14.8	54	7.0	54.5
Type IIa	240	9.5	38	6.3	38.3
Group II	405	16.2	50	8.1	50.5
Type II–IIa	12	.5	6	2.0	6.0
Group I & Group II	26	...	20	...	20.2
Group I & Type IIa	12	...	11	...	11.1
Group II and Type IIa	25	...	15	...	15.0
Group II and Type II–IIa	6	...	3	...	3.0
Group I, Type IIa, Group II	9	...	9	..	9.1

The number of individuals found to harbor the meningococcus was quite impressive. Ninety-one men of a total of 99 (91 per cent) were carriers at some time during the study, and each carrier was positive on an average number of 11 cultures. Fifty-four per cent of the men were found to carry Group I, 38.3 per cent Type IIa, and 50 per cent Group II meningococci.

No example of multiple nasopharyngeal infection with the meningococcus has been recorded in the numerous carrier studies reviewed. The stability as to type of the meningococcal carrier has been stressed.[17, 7a] In this survey, however, 20.2 per cent of the men carried both Group I and Group II, 11.1 per cent carried Group I and Type IIa, and 15 per cent carried Group II and Type IIa meningococci. From 9.1 per cent of the men all three types (Group I, Type IIa and Group II) of meningococci were isolated during the 10 week period of study. This may have resulted from the system of multiple selection of colonies for subsequent agglutination employed. It may also indicate the rapid exchange of nasopharyngeal flora among the individuals of the group.

The detailed results in Group "B" of each series of cultures are presented in Charts II and III. The carrier rates were persistently high except for a 2 week period when they fell to a much lower level. The men whose results contributed to these averages were not always the same. A dynamic equilibrium appeared to be maintained by the group as a unit. The static concept of a number of fixed meningococcal carriers circulating within a group could not be substantiated.

The oral administration of sulfadiazine in varying dosage resulted in a marked depression in the carrier rates. Those (Group "A") who received sulfadiazine, 1 gm. twice a day for 3 days, exhibited a prompt fall in the

CHART II

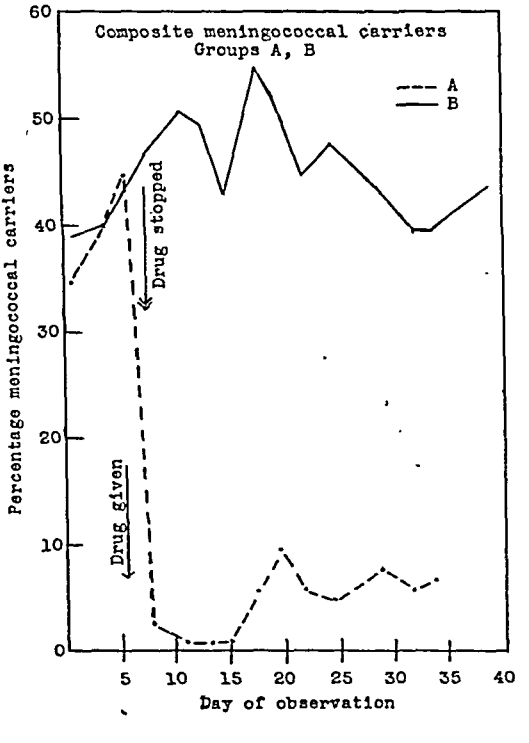
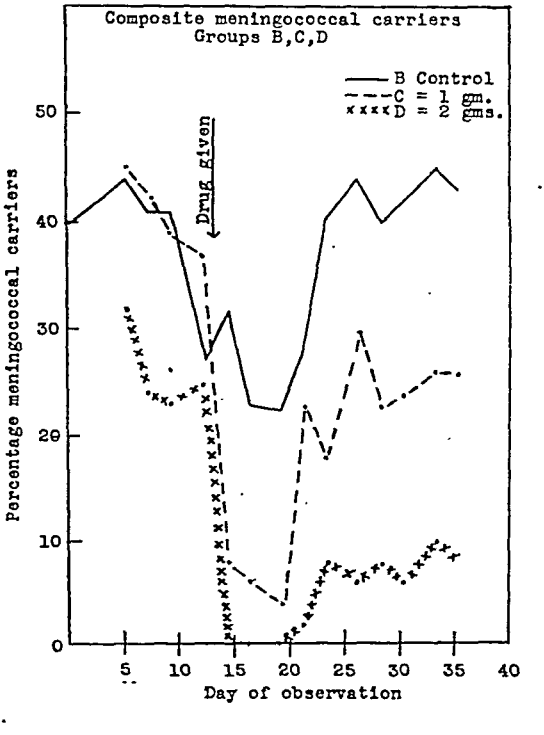


CHART III



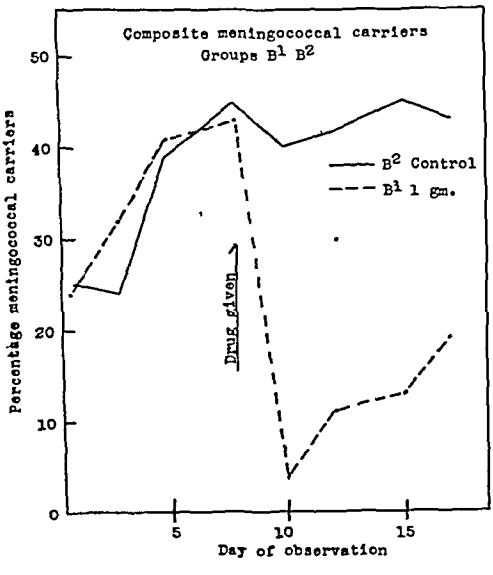
carrier rate to 3 per cent on the 2nd day, which reached 1 per cent 3 days after completion of the course of drug. Carrier percentages preceding the ingestion of sulfadiazine had been 35.4, 39.8, and 44.8 per cent. The Control Group "B" had yielded concomitant carrier rates of 39.4, 40.4, and 43.8 per cent before and 47.2, 51.1, 50.5 and 55.3 per cent, etc., during the period after drug. The lowered carrier rates among those receiving sulfadiazine were maintained for the 3 weeks they were followed. A slight rise to 9.9 per cent was observed 2 weeks after the sulfadiazine administration had been terminated. The latter were chiefly Group I carriers and a similar rise in this group was present among the Control Group "B."

No drug reactions were noted with this dosage of sulfadiazine. The average blood level on the 3rd day, when 4 gm. had been ingested, was 3.6 mg. per cent.

The Groups ("C" and "D") that received a single 1 and 2 gm. administration of sulfadiazine also showed a marked fall in the carrier rate, from 36 and 25 per cent to 8 and 0 per cent, respectively. The group that received a single gram dose, however, began to exhibit a rise in the carrier rate soon thereafter. Sixty-nine per cent of those carriers detected after 1 gm. of drug therapy still carried the same type of meningococcus as had been previously isolated, and the interval between positive cultures was 11.1 days. The average blood levels of drug obtained 4 hours after administration of 1 and 2 gm. of sulfadiazine were 2.9 mg. per cent and 4.4 mg. per cent. Two gm. of sulfadiazine were apparently sufficient to eradicate the meningococcus from carriers as only 33 per cent of those found positive during the 3 week post-drug period carried the same type of meningococcus, and the average interval between positive cultures was 19.2 days.

One gm. of sulfamerazine (2-sulfanilamido-4-methylpyrimidine) was given to half of Group "B" during the last week of the study. The effect upon the carrier rate was quite similar to that following a single gram of sulfadiazine. The rate fell to 4.4 per cent within 2 days, from a previous level of 43 per cent, but had returned within a week to 20 per cent. The average blood level attained 4 hours after ingestion of the drug was 3.0 mg. per cent. Sixty-six per cent of the men who reappeared as carriers still harbored the original type of meningococcus, and the average interval between positive cultures was only 6.8 days. A comparison of the cultural results obtained with the sulfamerazine treated group and a concurrently cultured control group is presented in Chart IV.

CHART IV



DISCUSSION

From these briefly summarized studies it may readily be inferred that the carrier state is a complex dynamic equilibrium and not simply the presence of a few carriers in a group. The diffi-

culty of achieving adequate control through segregation or chemotherapy of known carriers is evident. The carriers detected at any one culture period form only a small segment of the true carrier population. Therapy must be directed at the group as a unit, and aimed at those factors that determine the group equilibrium.

The "carrier rate" is a complex term which has been widely employed because it is easily computed mathematically. The carrier percentage derived from any one culture series is only an index and does not represent the true carrier population or their biologic status. It is directly influenced by the nature and size of the group, the time selected for culture, the cultural technic used, the frequency with which the same individuals are cultured, the refinements of identification employed, and a host of similar factors. These components, of prime importance, are often not visualized in the final representation of a numerical percentage.

The apparent discrepancy of various cultural surveys probably results from the interplay of those factors enumerated. Comparison of the results obtained in this study with those of others can be made only if this concept is appreciated. In this presentation of the carrier state the same group was repeatedly cultured for approximately 10 weeks. Multiple colonies from each individual were chosen for agglutination in type specific chicken sera. The cultures were taken during a period when meningococcal infection was prevalent, although no case had occurred in this group of men.

The administration of sulfadiazine in relatively small dosage resulted in a marked fall in the carrier percentage. This method of carrier control may be feasible in certain situations of forced overcrowding or epidemic prevalence among selected groups. Care must be exercised in the prophylactic employment of the sulfonamides, as its widespread and injudicious use might, in turn, lead to the vexing problem of wholesale drug sensitization or possible infections with sulfonamide resistant meningococci.

SUMMARY

1. A carrier survey is presented in which a group was cultured at frequent intervals for 10 weeks. Ninety-one per cent of the men were found to harbor a type specific meningococcus. The average carrier percentage was 41.0 per cent. More than 50 per cent of the individuals were found to carry two or more specific meningococcal strains.

2. The effects of varying amounts of sulfadiazine and sulfamerazine on the carrier rate are presented. These rates may fall to zero levels after the administration of as little as a single 2 gm. dose of sulfadiazine. The low carrier rate thus obtained persists far beyond the period required for complete drug excretion. Sulfamerazine was no more effective than a similar amount of sulfadiazine in this study.

3. The possible use of the sulfonamide drugs as a prophylactic measure to halt the spread of cerebrospinal fever among selected groups is suggested.

ACKNOWLEDGMENT—This investigation received most valuable support through the generous coöperation of Colonel Thomas Burnett, Surgeon, Third Service Command, Colonel Harry H. Towler, Post Surgeon, Fort George G. Meade, and his Staff, Major Morris L. Grover, Major Roger D. Reid, and Major Richard J. Bruce. Acknowledgment of great indebtedness is made to those men of the Medical Detachment, 1322 Service Unit, Fort George G. Meade, who so wholeheartedly served in this study.

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Meeting the Public Health Engineering Problems of the Army Overseas*

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THE problems of sanitary and public health engineering with the Army overseas are both administrative and technical. The administrative problems include the determination of the positions where engineers are needed and how they may be used within the framework of the Army in a manner to contribute to its military effectiveness. Another, and not the least, problem has been to organize and graft onto the rapidly expanding Army a sanitary engineering service which, in times of peace it had not seriously needed, and to integrate this engineering service with the Army's program of preventive medicine. The number of engineers and entomologists in the peacetime Sanitary Corps has been greatly increased. There are now more than 6½ times as many sanitary engineers and 15 times as many entomologists on duty as there were in 1941, and these must be increased by about 40 per cent during the next few months. Very few of our engineers had any previous training or experience in what may be called tropical sanitary engineering, and it has been necessary to provide this training, and to supplement it at times by teaming together our engineers and entomologists.

From both the administrative and the technical viewpoints, the control of malaria is the most important overseas problem of preventive medicine. To date, malaria has been responsible for more hospital admissions than has the Japanese Army. The administrative problem is to organize and provide personnel properly trained and equipped to combat malaria all the way from rear areas to the fox holes of the front lines. The technical problems of control are no less difficult for the men charged with putting this program into effect. To us in this country, the prevalence of malaria in the Southwest Pacific and in certain parts of Africa and Asia is almost unbelievable. Practically every native is infected. To make the problem more difficult, rainfall is very heavy—up to 250 inches per year in some areas—and anopheles mosquitoes breed in every puddle or, as Captain David B. Lee says, " wherever there are two teaspoons of water." Breeding has even been found in the folds of tarpaulins placed over piles of supplies.

Dysentery is second in importance to malaria as a cause of hospital admissions but falls far behind on the basis of noneffectiveness. Where recovery from malaria is a matter of months,

* Presented before the Engineering Section of the American Public Health Association at the Seventy-second Annual Meeting in New York, N. Y., October 12, 1943.

dysentery incapacitates for only a few days, as a rule. Other diseases are generally far less important but consideration must be given, from the engineering viewpoint, to various insect-borne and intestinal diseases including dengue, amebic dysentery, and possibly schistosomiasis.

The control of these diseases can be accomplished only by a broad program of preventive medicine, in which sanitary engineering has a most significant part. A necessary preliminary is the establishment and maintenance of sanitary discipline, that is, teaching the soldiers how to protect themselves against disease. This program utilizes specially made moving pictures and supplements these with lectures, booklets, demonstrations, and field instruction. Stress is laid on purification of water; protection and handling of food; safe waste disposal; cleanliness of kitchen and mess utensils; the use of mosquito repellents, sprays, and nets; the value of clothing as a protection against mosquitoes; and the necessity for the regular use of atabrin. This training and instruction aim to make the performance of these safeguards as routine and automatic as the movements in drill. Sanitary engineers and entomologists aid in this instruction and they supervised the preparation of the films on malaria control, field water supplies, and human waste disposal.

The control of malaria in the field requires the coördinated effort of all officers and men, and of all ranks and services. Therefore control may begin in the infantry company with the designation of a non-medical malaria unit consisting of one non-commissioned officer and one enlisted man, working under the direction of a battalion non-medical malaria officer. The duties of this unit may include responsibility that every man in the company has and uses repellents; that "water tidiness" is observed in the company area and all casual water is oiled; that soldiers use mosquito nets properly and keep them in repair; and that supplies of repellents and sprays are available. This company organization can do much to carry effective control into the very front lines by sending forward repellents, sprays, and atabrin; and by continued education and training of the unit to which they belong.

In areas farther back are Medical Department Malaria Control and Malaria Survey Units, of which a large number have been organized and are now serving on every overseas continent. A Survey Unit consists of one entomologist, one parasitologist, and eleven enlisted men, with necessary transportation and laboratory equipment. Its function is to determine the local conditions affecting malaria control, including the types and prevalence of mosquitoes likely to transmit the disease. A Malaria Control Unit consists of one sanitary engineer and eleven enlisted men, with transportation. Its function is to carry on control work—oiling, ditching, etc.—mainly with local hired labor, for which purpose it is equipped with a supply of tools, oilers, and dusters. While not normally intended to operate in forward areas, at least one of these units was engaged in control work within a mile of the battle lines in Sicily. Both the Control and Survey Units are under the direction of the Surgeon through one or more of the malariologists on his staff.

Experience has shown the need for specially trained troop units to carry on work in actual battle areas. Therefore to round out the malaria control program, arrangements are now under way to organize, equip, and train Malaria Control Companies of about 50 men, generally similar in organization and function to the Anti-Malaria Company of the Navy Construction Battalion. These may have some heavy equipment such as a bulldozer and a

small dragline, and plenty of small tools. They should initiate anti-larval work promptly around all areas that are to be held permanently. Screening of buildings at the earliest possible moment is highly desirable, especially mess-halls, recreation buildings, and other places where men gather. Native villages that are located within about 2 miles of areas to be occupied more or less permanently by troops should be moved, as they provide a most important focus of infection. In this connection, natives should generally be prohibited from visiting the camp between sunset and sunrise. Prevention of man-made malaria mosquito breeding places is another function of these anti-malaria units.

In addition to these special malaria control organizations, sanitary engineers are assigned to Armies or other troop echelons to advise on water treatment methods for the removal of ameba cysts, the cerceriae causing schistosomiasis, warfare gases, fish oil, and various toxic contaminants; on the selection of camp sites of a fairly permanent nature, where consideration must be given to the quality and quantity of water supply; the methods of waste disposal; the proximity of native villages and mosquito producing areas; and the sanitary condition of the areas adjoining the site. As in this country, it is easier and better to discover and correct sanitary defects before the troops move into an area than to attempt to remedy them after the camp is established. The maintenance of sanitary discipline by frequent inspections is of great importance. In all of this work, the engineer is under the direction of the Surgeon of the Command.

Overseas, as in this country, there are many service and area installations such as air bases, supply depots, hospitals and training and rest areas. A sanitary engineering service, generally similar to that provided for camps, posts, and stations in this country, is necessary for these installations. Work may include mosquito and other insect control, and supervision of water supplies and waste disposal facilities.

For service with the Military Government Division, 50 sanitary engineers and 25 entomologists have been assigned to the Provost Marshal General and more engineers have been informally requested. These officers will normally serve with the Public Health Section of the Military Governor's Staff. They will not act as the operating health department personnel in occupied foreign countries but will supervise the activities of native officials working under allied military control. They may, however, be required to advise on the repair and reconstruction, as well as the safe operation, of water supply and waste disposal systems.

Thirty-five engineers of the Sanitary Corps are on duty with the Coordinator of Inter-American Affairs in South and Central America. They are initiating and carrying out a broad program of environmental sanitation and public health, including projects for malaria control and the design and construction of water and sewerage systems. In connection with the development of the rubber resources of the Amazon, jungle bases have to be established, hundreds of miles from civilization, and necessary sanitary engineering works constructed to make these bases habitable. Each engineer is largely on his own, and he has been obliged to draw heavily on his resources of skill, knowledge, and adaptability.

All of the Sanitary Corps officers assigned to these and other overseas duties have been obtained from civilian life, or from the Army shortly after induction or enlistment. Few of them had any previous experience in foreign countries, and almost none in the areas in which our armies are operating. Instruction in what may be called tropical

sanitary engineering seems to have been wholly overlooked in most of our colleges and universities. As a result of all these factors, it was considered necessary to train our officers, not only in Army methods and routine but also in various phases of sanitary engineering in which they had not had previous experience.

As soon as an officer is commissioned he is ordered to a 4 to 6 week refresher course at one of the Medical Department Schools. This orients him in the general performance of his duties and instructs him in the elements of drill and the customs of the Army. Upon completion of this course, he is normally ordered to a post in this country where, through actual service, he improves his Army education and learns the channels and the methods through which results are accomplished. A number of special schools, such as malaria control and tropical medicine, are available to which he may be sent during this period. So far as possible, officers are given at least 6 months of experience prior to foreign assignments. However, due to heavy demands for personnel for overseas service, it has not been possible in all cases to adhere to this schedule. We have frequently been short of personnel because we have had to fill all our foreign duty requests, while maintaining our operating and training organization in this country.

So wide is the scope of overseas work in which Sanitary Corps engineers are engaged that it is obviously impossible to train them specifically for all the jobs they may encounter. Fortunately, this has not been necessary, for their basic training and experience have normally been such as to enable them to find satisfactory answers to most of the questions that arise. Because of the variety of problems that may and do arise, it is difficult to give here more than a brief outline of their duties. In planning for their utilization overseas, special efforts have been made to insure that, so far as possible, these officers are employed on sanitary engineering work and that they operate under a clear-cut authority, which permits them to concentrate on the job before them. Our sanitary engineers are serving on every continent and at every front. I am looking forward to the time when they will be back here to attend these meetings, and I hope there will be an opportunity then for them to tell personally of their work, for their experiences should prove most interesting and valuable to us all.

Present Status of Gonorrhea Control*

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IT should be a matter of grave concern to all of us that the gonococcus does not read the *Reader's Digest,* for I might otherwise have been able to report, simply, that a handful of "sodamint" sulfathiazole tablets has the situation well in hand and, thereupon, to the relief of all of us, have sat myself down. Perhaps we should do well to interest this ignorant organism in that estimable journal in anticipation of the article on penicillin in the control of gonococcal infection which is bound, sooner or later, to appear. In the meantime, however, there remain some problems which, lacking solution continue to interfere with the control of gonorrhea, and the discussion of which will occupy us here.

Because we are better off therapeutically than in all other categories, I shall reverse the logical procedure and discuss therapy first, leaving diagnosis and epidemiology for consideration, in that order, a little later on.

Early in 1937 sulfanilamide was introduced to the American scene by Dees and Colston [1] as a speedy cure for gonorrhea. The effect was explosive, for in spite of the badly needed overhauling which had been given by Pelouze to the older forms of treatment, they still left too much to be desired. Although calm review now reveals that most of the early reporters of the effect of sulfanilamide on gonorrhea used the best criteria of cure which were then generally available, and admitted many failures, it had become the universal opinion by the end of that same year that the control of gonorrhea was just around the corner and, as reported by *Time,* for something like 40 cents.

By the middle of 1938, however, the American Neisserian Medical Society had reported [2] that "The drug sulfanilamide is still under investigation . . . and no recommendations relative to its use are therefore made, but to those who are to use it experimentally, the following precautions are advised: Patients . . . should be observed for at least 3 months following apparent cure. In the advent of failure to observe clinical response within 5 days, it is wise to discontinue the use of the drug."

Fortunately, as other sulfonamides began to appear, culture of the gonococcus was not only improved, but more widely used in the evaluation of the efficiency of these new drugs. In 1939, the aforementioned Society declared [3] that "No claim for cure, from any source, should be given serious consideration unless supported by thorough cultural study."

In 1942, this same group of experts advised [4] that "Sulfanilamide should not be used for the treatment of gonorrhea because much more efficacious drugs are available." In the short span of 5 years, the star of sulfanilamide had reached its dizzy zenith and had set. It is known today that this drug does not cure more than 30 per cent of

* Presented before the Epidemiology Section of the American Public Health Association at the Seventy-second Annual Meeting in New York, N. Y., October 14, 1943.

gonococcal infections, and that a dangerously high proportion of the uncured patients remain asymptomatic carriers of infection for months.

Thanks to the lessons we have learned, and excepting the *Reader's Digest,* we have not been so completely over-optimistic about the newer sulfonamides. We are quite calmly aware that the most effective of them, sulfathiazole, sulfadiazine and sulfamerizine, cure not over 70 per cent of gonococcal infections within 2 weeks, under rigid criteria of cure and the adequate elimination of the element of time as a function of cure by itself.

In spite of many attempts to speed the cure and to reduce the number of failures by the administration of larger doses or of longer courses, the consensus still is that a treatment schedule of 4 grams a day for 5 days combines the greatest degree of safety with a maximum rate of cure. That there may be scientific evidence that this rate of cure cannot be exceeded for these drugs, no matter how they are administered, will be discussed a little later on.

Compared with the results obtained with pre-sulfonamide therapy, however, this degree of success is nothing short of miraculous. The sulfonamides, moreover, have made the treatment of gonorrhea a function of general medicine, and there is hope that the general practitioner may become far more interested and expert in their proper use than the urologist and the gynecologist ever were in irrigations, injections, prostatic massage, and douches of this and that. The manner in which they prevent complications, which so often require surgical intervention, would alone warrant their routine use.

Nevertheless, both the clinician and the health officer must be concerned with the too high proportion of failures, for the sulfonamide resistant strains may take over, in our promiscuous population, when the others have been exterminated and leave us as badly off as we were before. They are rapidly becoming a real problem in clinics, to which the uncured are drifting in larger and larger numbers from the offices of private practitioners. It is even becoming difficult to evaluate new drugs because so large a proportion of the infections of research clinic patients are now sulfonamide resistant.

Until penicillin appeared upon the scene, it seemed that fever therapy offered the only alternative to a return to the older and unsatisfactory methods of treatment for the sulfonamide resistant infection. It is doubtful whether any considerable number of physicians, even in our clinics, would be persuaded to use irrigations, injections, or prostatic massage, or could be taught to use them properly. They had not been so persuaded or taught during the many years prior to the appearance of the new drugs. The treatment of gonococcal infections in women by douche, suppository, and topical application is little more than a combination of uncertain hygiene and unsound medicine.

Fever therapy, on the other hand, involves certain serious risks and requires the hospitalization of the patient under the care of highly trained medical and nursing personnel. It could not be made generally available for years to come, even in those areas where hospital facilities exist at all, and its use on any form of mass basis is almost out of the question.

Little has been published to date upon the effect of penicillin upon gonococcal infection, but a considerable investigation of this new drug is going on within the limits of its availability. The results so far reported are almost too favorable, but the investigators are showing commendable restraint in their interpretation of those results in their application to the whole problem of gonorrhea. Most of the work, so far, has been done with sulfonamide re-

sistant infections, and there remains much more to be done before it is determined what the minimal effective dose may be, and how it may best be administered.

An interesting but as yet incomplete and unpublished investigation is under way at the Harvard Medical School and the Boston Dispensary which may solve the whole question of what drug to use, and do away, as well, with the difficult problem of case control. It appears that it may be possible to determine by cultural procedures within a matter of 24 to 48 hours whether a given infection will ever respond to sulfonamide therapy. If this proves to be so, a patient may be seen today and a specimen obtained for culture. Sulfonamide therapy may be started at once, to gain the advantage of prompt treatment for those infections which are to respond, and the patient directed to return in 48 hours. If cultural study discloses that the particular strain of gonococcus with which the patient is infected is sulfonamide resistant, the drug may be discontinued and penicillin administered without further delay. Those infections which it has been determined will respond to sulfonamide may be continued on the drug with the knowledge that they will be cured by a single 5 day course of treatment. Those treated with penicillin will also be cured by the single course of therapy. It will make little difference, outside research clinics, whether the patients ever return for post-treatment observation.

It may prove, of course, that penicillin will cure practically all gonococcal infection. If it can be synthesized and made readily and cheaply available, and if the treatment time can be so shortened that all patients will accept it, the problem of therapy will be solved.

Therapeutically, therefore, the possibility of controlling gonococcal infection looks brighter than ever before, although it is much too early to toss our hats into the air. (I hope that no representative of the press is in the room who lacks even greater restraint, for as we shall see, there are other conditions to the control of gonorrhea than the perfection of its therapy.)

THE DIFFICULTIES OF DIAGNOSIS

One stumbling block to the extermination of the gonococcus, however efficient the therapeutic armamentarium, is the difficulty of diagnosis. There is no procedure for the detection of infection with this disease which can be applied on a routine or mass basis, as the blood test for syphilis for instance may be. Search for infection begins ordinarily only when a person with clinically manifest disease presents himself for medical advice, or epidemiologic investigation has produced alleged contacts for examination. In women, the signs and symptoms of gonorrhea are often so mild that medical attention is not sought, or so confused with the signs and symptoms of other common genitourinary conditions that the physician never thinks of looking for the gonococcus. Innumerable males still treat themselves, or pay little attention to their infections beyond cursing them as temporary inconveniences and annoyances. This is especially true of Negro males. The best of treatments can have no effect upon those infections which do not come to medical care.

Unfortunately, however, diagnosis is not a simple matter when the patient does present himself for examination. Smears stained by the method of Gram are usually as efficient as cultures for the detection of the gonococcus in males with fresh infections. As the symptoms subside, smears become less and less useful until, in asymptomatic prostatic infections, they may fail to confirm a diagnosis in 80 to 90 per cent of the cases. If the patient has already taken any of the sulfonamide drugs (which many have when they first re-

port for medical attention) the value of smear examination may be quite problematical.

In fresh acute infections in the adult female, repeated smear examination will often result in the detection of the organism, but the first smear, which in private practice is often also the last, will be negative in at least half the cases. With the passage of time even repeated smear examination will offer little hope for confirmation of the diagnosis, and errors may be made due to the presence of other members of the group of Gram-negative diplococci. In female children the presence of these other organisms is so common, and they so frequently cause clinical symptoms indistinguishable from gonococcal infection, that nothing less than cultural identification of the gonococcus can be depended upon to make the diagnosis of gonorrhea.

Culture of the gonococcus is still a procedure which calls for much training and experience. The experts do not yet agree upon which is the most satisfactory medium, and contamination and overgrowth by other organisms have not been adequately controlled. Unless a medium can be devised upon which the gonococcus can be made to grow with the greatest of ease by the average bacteriologist, it is unlikely that cultural service will become very rapidly available to the country at large.

This disadvantage may be partly overcome if present efforts to devise a medium in which the organism can be kept alive are successful, for it may then be possible to send specimens by mail to central laboratories where expert bacteriologists are available. Cox [5] in particular at the Boston Dispensary has made considerable progress in the development of such a medium, although many kinks remain to be ironed out of the procedure. Phair,[6] at The Johns Hopkins School of Hygiene and Public Health, has discovered that specific serum may be produced in chickens which may provide a more rapid and satisfactory method of distinguishing between the several Gram-negative diplococci than is possible by the currently used fermentation tests.

The lack of adequate cultural facilities for the detection of gonococcal infection has been keenly felt during the war emergency, since the armed forces have undertaken the identification of contacts of infected men. It is almost the rule that by the time the female contact can be located and examined, smears are of little use, and clinical examination produces only indeterminate results. This has led to the advice by many experts that if an alleged contact so much as admits sexual exposure outside of marriage, or has any symptom or sign which might indicate gonococcal infection, treatment as for gonorrhea should be given. The danger of toxic reaction is so slight when compared with the risk of continued spread of infection by an undetected case, or of pelvic extension in an untreated case, that this procedure is held to be quite justified.

If, however, we may be so rash as to assume that the therapeutic and diagnostic problems are on the way to solution, may we then assume that the control of gonococcal infection will be assured? That will depend, of course, upon what proportion of the total number of infections in existence at any given time are detected and cured before as many new infections can be caused to replace them. Since no one knows what the incidence of gonococcal infection in the civilian population may be, we can arrive at no approximation of the job in public education which lies ahead. One has only to note the casual manner in which urethral discharges are treated by most colored and many white males to suspect that this job of education will be a large one.

It would seem that it should be possible to teach males, if not to suspect

exposure in every promiscuous sexual relationship, to realize at once that any urethral discharge which appears soon after such a relationship is abnormal and most likely due to disease. This will involve the correction of the popular notion that strain can cause such a discharge. It will be difficult to convince most males that gonorrhea is actually a serious disease (which it is *not* in the great majority of infected males). If, however, it can be demonstrated that treatment of an annoying and embarrassing discharge is promptly effective, inexpensive, and less inconvenient than the condition itself, males may be persuaded to seek treatment for any urethral discharge without having first to be convinced that it is due to a gonococcal infection.

If the treatment is also sufficiently free from risk, it may be worth while to treat every urethritis first, and attempt a more specific diagnosis only if therapy fails. This might not be as outrageous as it sounds if we can be persuaded to accept urethritis as an adequate diagnosis, even for purposes of morbidity reporting, and forego the doubtful satisfaction of accumulating still more doubtful statistics on gonorrhea. If urethritis is eventually controlled, gonococcal infection is bound to disappear with it.

This brings us abruptly face to face with the question of epidemiology. It will be argued that unless the diagnosis of gonorrhea is made there will be no basis upon which contact tracing may be pursued.

It is true that it would be ridiculous to follow all of the sexual contacts of every woman with a leucorrhea, or who can be persuaded to admit sexual promiscuity. I doubt, however, whether the control of gonorrhea will derive from the detection and prompt treatment of infection in women. It will be impossible to educate the female to suspect infection through the separation of the signs of gonorrhea from those of the many other genitourinary conditions to which she is heir. Physicians cannot do it without culture, or without good luck with smears. It is not easy to detect infection in the known female contacts of males with gonorrhea. I am not at all certain that we are not wasting our time with case finding. It is my opinion that if infection in most males could be detected and cured immediately after it became clinically evident, gonococcal infection in most females would soon disappear. It might be worth while to try the experiment of concentrating upon the control only of urethritis in the male, depending upon education, clinical diagnosis, and our excellent therapeutic armamentarium for its accomplishment.

Treatment, of course, is the application of a control measure after infection already has occurred. Ideally, disease is prevented. The control of gonorrhea by preventive measures can be accomplished only by one of two procedures, or a combination of them; namely, prophylaxis and the abandonment of sexual promiscuity.

The proponents of prophylaxis argue that there will never be any effective abandonment of promiscuity or, at any rate, that we cannot afford to wait for it. The proponents of the abandonment of sexual promiscuity argue, even more vigorously, that prophylaxis encourages promiscuity and will forever perpetuate it.

A truly effective and popular prophylactic would be an attractive and tempting solution of a great and serious public health problem. On the other hand, I am not convinced that the control of disease is the most important consideration among the many which revolve around the question of what to do about sexual promiscuity. We live in a civilization which, although notorious for its violation of them, is bound round with behavior codes. They have

not arisen out of the perverseness of human nature, but out of a fierce insistence that the integrity of the family, as the fundamental unit of our civilization, be preserved. I am not competent to referee the debate as to whether we have the right, for the immediate solution of our own problem, to ignore these other considerations, and I shall drop the subject at this point. As a reporter of what is going on in the field of gonorrhea control, however, I am obliged to pay attention to the fact of prophylaxis.

Whether the promiscuous members of the population can ever be persuaded to use prophylaxis regularly and intelligently is a moot question. Currently available prophylactics are unattractive and inconveniently used. They have never been popular, although there is wide knowledge of their availability. In the armed forces, where instruction is regularly given in their use and importance, and where they are all but forced upon the men, they are so inadequate to the control of infection that tremendous pressure is being put upon civilians to repress promiscuity in their communities.

The average male is not sufficiently impressed that there is any danger of infection in his sexual relationships with the "nice, clean girl" with whom he consorts, to be persuaded to use inconvenient and messy prophylactics. But if a prophylactic could be produced which could be popped into the mouth, in pill form, at the first, faint prickings of doubt, *after* intercourse, when the excitement of the chase had been succeeded by more cool and more sober reflection, prophylaxis might become popular in spite of all the arguments for, or against. Research probably will not cease until it is found, but I shall offer no prediction as to what the subsequent moral upheaval will be.

The title of this paper is The Present Status of Gonorrhea Control. I can offer not the slightest information upon that point. The therapeutic armamentarium is excellent and is constantly being improved; we may hope for great improvement in diagnostic procedures; we should be able to do better than we have with public education, and someone is certain sooner or later to produce an effective and popular prophylactic. But there is no base line from which we can measure progress. We know next to nothing of the current incidence or prevalence of gonococcal infection. Our instruments of measurement are so crude that we cannot even detect wide fluctuations in these values. That, however, should not detain us, for if we make the fullest use of every facility at our disposal we may one day discover that no person can any longer be found who can produce a gonococcus. That day, the *Reader's Digest* will please note.

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Plasma Reserves for Civilian Defense, Their Distribution, Control, Preparation and Clinical Use*

With Special Reference to the Treatment of Infectious Diseases

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WHEN the United States was so treacherously attacked in the Pacific on December 7, 1941, the U. S. Office of Civilian Defense, realizing that further attacks could well be expected, accelerated the development of the various protective services which had been established earlier in the year. The Medical Division felt that adequate reserves of plasma were of vital necessity for the treatment of civilian casualties which might result from enemy attacks. The existing donor procurement program of the American Red Cross and the commercial laboratory facilities for the preparation of plasma were required for the expanding needs of the armed forces, so that we could not expect to obtain large amounts of plasma from this source. We, therefore, secured the coöperation of the Public Health Service in developing an independent program.

In April, 1942, $292,500 was allocated to the U. S. Public Health Service for this purpose by the President from his Emergency Fund, and the program was continued during the fiscal year of 1943 with an additional Congressional appropriation of $499,500. The language of the appropriations permitted the procurement of plasma from commercial laboratories and the making of grants-in-aid to public and private hospitals to assist them in preparing local reserves of blood plasma. The program, therefore, has been supported by funds provided by the U. S. Public Health Service and administered by the Medical Division of the Office of Civilian Defense.

The grants-in-aid program for hospitals, which has been our chief activity, was conducted in accordance with regulations issued by the Surgeon General. It was felt that the establishment of hospital blood and plasma banks was consistent with good hospital practice and that they would be of real and lasting value to the community. To be eligible to receive a grant-in-aid, a hospital was required to have a bed capacity of at least 200, to be on the approved list of the American College of Surgeons and the Hospital Register of the American Medical Association, and to have, as director of the plasma project, a physician whose qualifications were the equivalent of those required by the American Board of Pathology for its diplomates. The hospital also agreed:

1. To build up a plasma reserve of at least one unit per bed within 3 months after delivery of the necessary equipment, except that hospitals which were located within 75 miles

* Presented before the Health Officers Section of the American Public Health Association at the Seventy-second Annual Meeting in New York, N. Y., October 13, 1943.

of a Red Cross bleeding center were given a longer period of time to build up their reserves and were required not to engage in publicity campaigns for donor procurement. (A unit of plasma is defined as that amount obtained from 500 ml. of citrated blood, usually 300 ml.).

2. To maintain this plasma reserve for the duration of the war and release it for use without charge for the treatment of casualties caused by enemy action or sabotage on order of officers of the Emergency Medical Service.

3. To prepare plasma by one of the technics approved by the National Research Council.

4. To utilize the equipment to operate a blood and plasma bank for its own routine needs for the duration of the war. (The equipment now belongs to these hospitals and the plasma reserves will become their property at the end of the war.)

On June 30, 1943, when the appropriation terminated, grants had been made to 168 hospitals. Two state laboratories and one county laboratory received priority assistance in obtaining equipment. These institutions have pledged a total reserve of 78,790 units of plasma, of which 70 per cent has now been prepared. In addition, many other hospitals, operating blood and plasma banks independently of our program, have voluntarily placed their plasma reserves, which total 32,600 units, under the control of the Emergency Medical Service.

In the preparation of their plasma, the grantee hospitals have followed the technics set forth in the manuals, *A Technical Manual on Citrated Human Blood Plasma* and *A Technical Manual on the Preservation and Transfusion of Whole Human Blood,* prepared under the direction of the Subcommittee on Blood Substitutes of the National Research Council. These manuals discuss the operation of a hospital blood and plasma bank and describe several approved technics for the storage of whole blood and the preparation of plasma. All of these methods employ a "closed system," in which the entire procedure, from the collection of blood to the filling of a final container of plasma, is carried out in such a manner that the blood and plasma are never exposed to anything but filtered air. The use of such a system makes contamination of plasma a rare occurrence.

Plasma may be prepared either by centrifugation of freshly collected blood or by gravity sedimentation of whole blood stored in a refrigerator. The use of a dextrose preservative solution is recommended if more than 5 day storage of whole blood is desired. Plasma is pooled in minimum amounts of 2,000 ml., unless 50 per cent dilute plasma is being prepared. The reserves of plasma are stored either in the liquid state at room temperature or frozen and kept at a low temperature. Almost all of the hospitals in this program have centrifuge equipment and low temperature storage cabinets. Many of them employ both methods of plasma preparation and both methods of storage.

Recent studies at both the Army and Navy Medical Schools have demonstrated that liquid plasma kept at room temperature has a safe storage period of 2 years. The temperature should be held between 60 and 80° F., with allowable maximum limits of 55 to 100° F. There is, of course, rapid loss of prothrombin and complement and a slow loss of antibody content with this form of storage, but these changes do not interfere with the value of the plasma in the treatment of shock. Plasma stored in the frozen state remains practically without change during storage. At +5 to —4° F., the official limit of storage is at present 3 years. I feel sure that this time limit is conservative. Actually, there seems to be every reason to believe that plasma can be stored indefinitely at this temperature range.

In addition to the grantee hospital program, it was felt to be necessary to obtain a supply of dried plasma. With the approval of the Surgeon General

of the Army and the coöperation of the Blood Donor Service of the American Red Cross, 37,500 units of dried plasma were obtained from the Hyland Laboratory in Los Angeles. In this area the Red Cross was able to recruit and bleed donors for us without interfering with its procurement for the armed forces. An additional 12,500 units of dried plasma were later obtained from the Army supply after the armed forces had accumulated a safe reserve. This gave us a total of 50,000 units. The Red Cross has provided an additional 5,000 which is available through its Disaster Relief Service.

In addition to the dried plasma, a third phase of the program was carried out in coöperation with the Army, Navy, and the American Red Cross. In order to afford immediate protection to those cities in which the Red Cross was operating donor centers, the Medical Division placed reserves of frozen plasma, obtained from commercial firms, in each of these cities during the summer and early fall of 1942. Arrangements for this were made with selected hospitals which were furnished with refrigerated storage units. Frozen plasma was used instead of the dried form because the commercial firms at that time had on hand more frozen plasma than they could dry, and the armed services needed only the dried plasma.

In all, 29,500 units of frozen plasma were distributed throughout the country. This plasma, as well as the 50,000 units of dried plasma previously referred to, was prepared from blood collected by the American Red Cross and obtained through government contracts with the various commercial laboratories by paying these firms the cost of processing.

In the selection and approval of the 168 grantee hospitals and in the distribution of the commercially prepared dried and frozen plasma, the first consideration was to obtain a plasma reserve in each locality which was felt to be adequate in the light of local risk of enemy attack, sabotage, and industrial accidents. It was, of course, not possible to provide sufficient plasma in every community to meet the needs of all casualties which might result from a "blitz" type of disaster, but there is, generally speaking, an adequate amount locally available in every important community to handle any situation for a period of several hours. This provides time in which to send in any necessary additional supplies of plasma if the community is in danger of exhausting its own local supplies.

The dried plasma has been of inestimable value in enabling us to attain a more satisfactory distribution, because, unlike liquid or frozen plasma, it can be stored anywhere, providing the package is not allowed to freeze or is not exposed for long periods to temperatures above 130° F. It can, therefore, be transported with ease. Also, since it was obtained in the standard Army-Navy type package, each unit is complete with distilled water for reconstitution and an administration set, so that it can be used in the field without regard to hospital facilities. Dried plasma offers no advantage, however, for general hospital use. Therefore, we have utilized the dried plasma in two ways. First, relatively large depots of this plasma have been established in key cities where there are excellent transportation facilities. These depots constitute our primary mobile reserve which can be shipped to other communities to meet emergency needs. Second, it has been distributed, usually in small amounts, to provide enough plasma for the initial protection of small, relatively isolated communities.

For purposes of administration, the Office of Civilian Defense has divided the country into nine Regions which are coterminus with the Army Service

Command Areas. There is a field office for each Region which maintains direct contact with the states. The plasma reserves are controlled by the Civilian Defense Organization. The local Chief of Emergency Medical Service, whose authority covers one city or county, has control of the plasma available locally. If he should need an additional supply, he requests it from the State Chief of Emergency Medical Service, who has control of all the reserves stored within his state. In approximately half of the 48 states, the State Chief is also the State Health Officer. If the state's supply should be in danger of exhaustion, the State Chief can obtain more plasma from the Regional Medical Officer, who has control over all plasma reserves within his Region. In addition, the Regional Medical Officers may arrange for the movement of plasma from one Region to another.

We have been able to make very satisfactory arrangements for the shipment of plasma in an emergency. The Civil Air Patrol will fly plasma on request of the Regional Medical Officer whenever air transportation is necessary. The Railway Express Agency has agreed to accept an emergency shipment of plasma for the government if given only the serial number of the bill of lading which will later be issued to cover the shipment. This means that there need be no delay in the shipment of plasma by rail or air express. Most states have also made arrangements with the state police, highway patrol, or sheriffs, as the case may be, for auto transportation whenever that becomes necessary.

To summarize, there are at present available to the Emergency Medical Service more than 160,750 units of plasma stored in 675 storage depots in 382 cities in the United States, and there is no community in this country that does not have quick access to these plasma reserves, should an emergency arise. Plasma reserves also have been provided through this program for Alaska and Puerto Rico, but not for Hawaii and the Canal Zone which have been under Army administration.

Today, there is no question of the tremendous value of plasma in saving the lives of persons who have been seriously injured, whether it be on the battle fronts or on the home front. It is now known that in all severe injuries there is a loss of circulating blood volume into the injured tissues as well as loss by hemorrhage. This causes the circulation to become inadequate, resulting in tissue anoxia and shock. The shock state may terminate in death if adequate treatment is not given promptly. If the blood volume is restored within a few hours after the injury and maintained at an adequate level, an individual can recover from very severe trauma. The special value of plasma is that, like whole blood, it restores blood volume physiologically, except for the red cells which may have been lost through bleeding. Unlike whole blood, it can be made available in large amounts, can be stored over long periods of time, and can be administered without reference to blood group, cross matching, or skin testing. Plasma, like whole blood, is far superior to salt solution, glucose, or acacia for treating shock.

It should be emphasized that plasma must not be considered to have completely replaced the use of whole blood in the treatment of shock. In fact, if it is immediately available, whole blood is preferable to plasma if the shock is due to hemorrhage. However, even in a case of severe hemorrhage, plasma in adequate amounts is life saving and should be used if whole blood is not immediately available, for this can always be given later on. A person cannot survive long without a blood volume large enough to maintain adequate cir-

culation, but he can survive a severe degree of anemia.

Unfortunately, there is no rule or formula by which one can determine the amount of plasma necessary in a given case. The only safe and practical procedure is to give enough plasma to achieve the desired result; namely, restoration and maintenance of normal blood volume. Time does not allow for a detailed discussion of dosage, except to say that a severely burned person may require 3 to 6 liters of undiluted plasma in the first 72 hours and that at least 1 to 1.5 liters are required in cases of severe injury.

Since April, 1942, when the Public Health Service began this plasma program, over 5,000 units of plasma have been used by the grantee hospitals in the treatment of their regular patients as well as the victims of civilian disasters. The excellence of the technic employed by these hospitals in preparing and administering plasma is evidenced by the fact that they have experienced less than 1 per cent of reactions with its use. These have been of the pyrogenic or urticarial types, which are rarely severe. The number of reactions reported is very close to the irreducible minimum which may be expected to accompany the intravenous administration of fluids.

The plasma reserve and the organization for distributing it have proved their value many times. One of the first incidents in which these reserves were used was the Cocoanut Grove Nightclub fire in Boston. In all, 1,308 units of plasma were used to treat 181 burned patients, most of whom lived. Their survival was due, in large part, to the prompt administration of adequate amounts of plasma. Of the plasma used, 833 units came from the Civilian Defense reserves in Boston, which amounted to 2,800 units at that time. The remainder was supplied by the U. S. Navy and the Red Cross.

In Rochester, N. Y., 57 units of plasma were used to treat 15 workers injured in an explosion at the Rochester Fireworks Company. Five workers burned in an explosion at the Tidewater Oil Company plant at Bayonne, N. J., required 24 units. Some of the other incidents in which these plasma reserves have been used are: the crash of a bomber into a Seattle, Wash., packing plant, an explosion in a munitions plant at Elkton, Md.; a war plant fire at Amsterdam, N. Y.; the explosion at the Congoleum-Nairn plant in Kearney, N. J.; the wreck on the Pennsylvania Railroad at Philadelphia; the Lackawanna Railroad accident at Wayland, N. Y., and the hotel fire in Houston, Tex.

On several occasions plasma has been supplied to Army, Navy, and Coast Guard stations in this country to meet an emergency when their own plasma was not immediately available in sufficient quantity. Such a case occurred last May at Abilene, Tex., when a column of soldiers marching at night was run through by a motorist. Plasma was requested at about 1 a. m. from one of our grantee hospitals at Fort Worth and was delivered to the station hospital, 150 miles away, by the Civil Air Patrol within one hour after the request was received.

The establishment and operation of blood and plasma banks in the larger hospitals has proved to be of great value in improving the treatment of the sick and injured. Although the most spectacular results are seen in the treatment of traumatic and burn shock, the ready availability of blood and plasma is resulting in better preoperative preparation of surgical patients who show decreased plasma proteins or anemia. Likewise, the adequate and prompt replacement of the blood loss which accompanies major surgery, prevents shock and keeps the patient in excellent condition during the opera-

tion. This permits the longer surgical procedures to be carried out without the need which so often exists to "finish the operation before the patient goes bad." Further transfusions of blood or plasma are often indicated during convalescence because of continued anemia or depletion of blood proteins. Convalescence is smoother and shorter when the blood components can be kept within normal limits. The blood bank also facilitates the treatment of the anemias, blood dyscrasias, and acute infections.

It is my belief that hospitals, equipped to prepare plasma and store plasma in the frozen state, will find increasing use for it in the treatment of infectious diseases. I should like to review the present status of this field and point out some of its possibilities.

The development of the present use of convalescent sera is due largely to the work done by the Serum Centers which have been established in a few large cities, such as New York, Chicago, Philadelphia, and Los Angeles. As a result, the medical profession at large has had little opportunity for personal experience with the various convalescent sera and is aware of their value only through the literature. However, the experience of these Serum Centers during the past several years has demonstrated that convalescent human serum is of therapeutic value. In their hands, it has been most satisfactory in the prevention and treatment of measles, scarlet fever, and mumps. For these diseases, the material is prepared by pooling the serum obtained from 25 to 50 donors bled within 4 to 6 months after recovery from the disease. After testing for sterility, such sera are placed in final containers of suitable size and either dried or stored in the frozen state until needed for use. Pooled normal adult plasma (or serum) is one-fourth as potent as these convalescent sera and equally good results have been obtained with both when given in proper dosage. Unlike the antisera prepared from immunized animals, the use of human serum or plasma is not attended by the danger of anaphylactic reactions, serum sickness, or the development of a sensitivity which would contraindicate the further use of such sera. The transmission of jaundice by transfusions of human plasma and serum requires further study. Fortunately, this is a rather rare occurrence.

In the prevention of measles (rubeola) and in treatment of the disease during the preëruptive stage, both convalescent serum and pooled normal adult serum (or plasma) have been equally effective in proper dosage. Since 95 per cent of the deaths due to measles occur in children up to 4 years of age, it is very important to prevent the disease, if possible, in this age group. The intramuscular administration of 10 to 20 ml. of convalescent serum, depending on the age of the exposed child, within the first 7 days after exposure, will result in 50 to 70 per cent complete protection and 20 to 40 per cent of modified measles. Since modified measles confers the same degree of immunity as is acquired from an unmodified case, it is desirable to attempt to modify rather than prevent the disease in children over 5. This can be done with fair regularity by giving one-half the dose required for complete protection. There is some evidence that the intravenous administration of large doses of serum also may be of some value in lessening the acute symptoms when treatment is begun after the eruption has appeared.[1-5]

Scarlet fever convalescent serum has also been strikingly effective, and pooled normal adult material appears to give equal results if administered in proper dosage. Convalescent serum, given intramuscularly, in dosage of 10 to 40 ml., depending on the age of the

patient, and within 24 to 48 hours after exposure, will reduce the incidence of the disease among the exposed individuals from 10–15 per cent to only 1 per cent who show a typical course and 0.5 to 2 per cent who have mild or modified scarlet fever. Since this passive immunity lasts only 10 to 14 days, a protective dose of serum should be repeated every 10 days if exposure continues. In the treatment of scarlet fever, excellent results are also obtainable if the serum is given intravenously. The recommended dosage, if treatment is begun during the first 36 hours of the disease, varies from 20 to 100 ml. depending on age. In 75 to 85 per cent of the cases so treated, the acute symptoms subside in 12 to 24 hours.[1, 4] The incidence of complications is reduced by 50 per cent and those that do develop are usually mild in nature. If the acute disease does not clear, repeated doses are indicated at 48 hour intervals. Almost as good results may be obtained up to the 6th day of the disease in uncomplicated cases. Even cases with complications are usually much benefited if they receive at least 3 standard doses at 8 hour intervals. It is worth noting that scarlet fever convalescent serum has given good results in several other diseases caused by the hemolytic streptococcus; such as erysipelas, pharyngitis, cervical adenitis, post-operative complications of mastoiditis, and pneumonia. Experience with the use of convalescent serum in conjunction with the sulfonamides has shown, at times, striking results due apparently to a synergistic effect of the combined therapy. Therefore, serum offers an alternative treatment when sulfonamides are contraindicated and an additional therapeutic agent in difficult cases.[1, 3–8]

The development of mumps has been prevented in 90 to 95 per cent of exposed individuals by the intramuscular administration of 20 to 40 ml. of convalescent serum, given within 1 week after exposure. Dosage again depends on the age of the individual. Prevention is, of course, most important in adolescents and adults to avoid the danger of orchitis which accompanies this disease. Thalhimer[1] and others have also used convalescent serum to treat the acute disease, and report prompt subsidence of acute orchitis when 40 ml. of serum is given intravenously.[3–5]

The Philadelphia Serum Center has had good results in the use of hyperimmune human serum in the prevention and treatment of whooping cough.[4] This serum is prepared from donors known to have had whooping cough and who are receiving repeated injections of pertussis vaccine. The agglutinin titer of such serum is 1/1280 to 1/5120 as compared with a titer of 1/300 in the average convalescent. Ten to 20 ml. of this serum was given intramuscularly to 215 infants and young children during the first week after exposure. Complete protection was achieved in 78 per cent of the cases, 10 per cent had a very mild illness, 6 per cent had a moderate disease, and 6 per cent developed typical whooping cough, except that no complications were seen. This dosage of serum should be repeated every 5 to 7 days if exposure is continuous. Good results were also obtained in the treatment of the acute disease. One hundred and twenty-three of 315 cases treated were infants of 6 months or younger. The dosage employed was 20 ml., intramuscularly, repeated daily for 3 or 4 doses. Subsidence of the major symptoms occurred within 10 to 14 days in about 69 per cent of the cases, with a death rate of only 1.5 per cent. The Philadelphia group is now recommending that the intravenous route of administration be used in treatment of the acute disease and that larger doses

be administered. Currently, 60 to 100 ml. of serum is being given intravenously to critically ill infants and repeated if necessary.

The value of convalescent poliomyelitis serum has not been established. There are some who are convinced of its beneficial effect, but this point of view is not generally accepted. Levinson, who has had a large amount of experience with the use of convalescent poliomyelitis serum, is a firm believer in its value.[9-11] It is a difficult disease in which to gauge the effectiveness of any specific therapy, but he feels strongly that his observations indicate that the intravenous administration of adequate amounts of serum will prevent the development of permanent paralysis, if treatment is begun in the preparalytic stage, and that it will arrest the progress of paralysis, if treatment is begun later during the acute disease. Serum treated cases, according to his data, characteristically show a fall in temperature and pulse rate with clearing of the acute symptoms within 24 to 48 hours. It is his feeling that the poor results experienced by other investigators have been due to the employment of too small amounts of serum. His dosage schedule is 60 ml. plus 1 ml. per lb. of body weight, repeated every 12 to 24 hours, until results are obtained. One to three doses give good results in the majority of cases. Levinson states that in his experience pooled normal adult serum is also effective if given in twice the dose recommended for the convalescent material.

Recent experience[11, 12] would indicate that both convalescent and pooled normal adult serum or plasma were of definite value in the treatment of cases of virus pneumonia seen during two recent outbreaks of this disease. A prompt fall in temperature with recovery from the acute symptoms was seen in the majority of about 70 cases so treated. Braley and Sanders recently reported excellent results in a small group of patients with epidemic keratoconjunctivitis treated with convalescent serum.[13]

A few years ago, while conducting a study of the value of specific antisera in the treatment of the pneumococcus pneumonias, Taplin[14] made a most interesting observation. Several cases were found in which a crisis did not occur, although an excess of antibodies was present as evidenced by the Francis test. The blood complement level was checked, among other things, in an attempt to determine the reason for the apparent failure of serum therapy. Six of these cases were found to have a deficient blood complement and were given 200 to 400 ml. of fresh plasma intravenously. All 6 cases had a typical crisis within 24 hours. Further investigation along these lines was conducted in 1941 by a group at the Syracuse College of Medicine.[15] In addition to cases such as those described, a deficiency of complement was found to exist, at times, in other acute infectious and allergic diseases. For example, a deficient blood complement was observed during the first day of symptoms in one case of serum sickness and in one of acute nephritis complicating scarlet fever. Striking clinical improvement was noted in both cases following the prompt administration of 300 ml. of fresh plasma intravenously.

These interesting indications of the possible value of fresh plasma or serum in the treatment of acute infections and allergic syndromes are evidence that there may be various therapeutic properties of blood and blood derivatives as yet unexplored. More investigation must be carried out to determine the value of convalescent serum in poliomyelitis, virus pneumonia, and other acute infections. The evidence of the effectiveness of this therapeutic agent in the prevention and treatment of measles, scarlet fever, mumps, and

whooping cough is sufficiently important to warrant the interest of every state health officer.

It may be desirable for public health laboratories to undertake serum center projects. This may be accomplished by interesting and aiding large hospitals to expand their blood plasma banks to include such a service, or by establishing a plasma or serum service in a public health laboratory. It is also important that the reserves of pooled normal adult plasma, developed to meet the needs of those injured in disasters, be maintained after the war, so that injured civilians can receive the same excellent and prompt care that has been possible in most of the serious accidents occurring during the past year. This would seem to be the logical interest of health officers who should promote, properly control, and further such a program. The States of New York, Michigan, Illinois, Vermont, Iowa, and Texas are already engaged in or interested in establishing such a service.

The development and maintenance of plasma reserves for the treatment of large numbers of injured and an adequate convalescent serum service constitutes a real challenge to those charged with guarding the health of the nation.

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Problems in Population Estimation*

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IN addition to their normal responsibilities, public health officials now have the task of safeguarding the health of millions of Americans who have moved from place to place during the war emergency. Some idea of the magnitude of their problems can be gained from the estimate that perhaps as many as one-sixth or one-seventh of the inhabitants of the United States have moved from one county to another since the 1940 Census was taken. To meet this challenge intelligently health officials need to know how many and what kinds of people now live within their jurisdictions.

Actually no one knows exactly how many people have moved throughout the country, whence they have departed, and where they have arrived. Although people are supposedly more important than material goods, it is harder to obtain adequate statistical information concerning the composition, characteristics, and distribution of population than to make detailed inventories of the commodities which people produce or consume. It is especially difficult to obtain adequate current population data in the abnormal situations where they are most acutely needed. Census methods which have sufficed in normal times cannot be applied often or quickly enough, and the ingenuity of statisticians is called upon to develop new methods of currently keeping track of our rapidly moving people.

Thus the American Public Health Association, along with organizations concerned with problems of labor supply, education, and various other community services, should be interested in promoting the development of adequate current population statistics.

Registration officials have a dual task: to provide official documentation of facts about individuals and to produce raw or finished statistical data. This paper is concerned with the second function. It may be well to begin by summarizing the principal uses of vital statistics, since this paper is premised on the assumption that there is no time today for statistics unless they are useful. Vital statistics are used:

1. To describe the past and current growth of the population and to predict its future trends.
2. To describe past and present health conditions as reflected in mortality and morbidity rates and in life tables; and to anticipate future trends in the light of these indices.
3. To appraise the effectiveness of specific public health measures.

To accomplish almost any of these purposes it is essential to know or to estimate the size and composition of the population as of definite dates, past, present, and future. As a basis for computation of crude vital rates, data on the total population are essential; for more refined analysis involving specific and adjusted rates and life tables the composition of the population by age, sex, race, and sometimes other characteristics must be known or assumed.

* Presented at a Joint Session of the American Association of Registration Executives and the Vital Statistics Section of the American Public Health Association at the Seventy-second Annual Meeting in New York, N. Y., October 13, 1943.

Population data are needed not only as the denominators of various vital rates and indexes but also for direct use in planning: (a) land use and the provision of public utilities and other community facilities, (b) the apportionment of financial aid and central governmental services, and (c) especially in times of war-begotten scarcities, the distribution of consumers' goods.

To make a further catalogue of things which are obvious but nevertheless have to be thought about, there are a half-dozen different ways of measuring or estimating the population of a given area:

1. Complete census enumeration
2. Continuous population registration
3. Mathematical interpolation and extrapolation of the net trend of population growth as indicated by successive censuses
4. Analytical and synthetic projection of population changes, as distinguished from the crudely empirical projection of the net trend
5. Estimation from *ad hoc* sample enumerations
6. Estimation from data collected for other than demographic purposes

To take a complete census is the most forthright and foolproof method of determining how many people there are in a given area at a given time. But it is also a very expensive procedure, and as you all know the federal government has so far seen fit to undertake it only once every 10 years. For some decades past the idea of shortening the interval between national censuses to five years has been widely advocated, but at present most people's attention has been directed to the task of finishing a rather large war. At best a considerable interval must elapse between complete censuses, whether it be 10 years or 5. For the purposes already mentioned it is necessary to know something about the population all the time and not just at isolated census dates.

The Scandinavian countries with their systems of continuous population inventories have long been the envy of American statisticians. Last year the Vital Records Commission, appointed by Federal Security Administrator McNutt, seriously studied the feasibility of registration of the American population and the establishment of continuous registers which would be kept up to date by accounting for all births, deaths, and changes of residence, as well as perhaps all marriages and divorces. The commission sketched the main outlines of a concrete plan for such registration and recommended that it be undertaken at once "if deemed essential to the war effort." Consultations with the war agencies of the federal government led to the conclusion that it would be unwise to attempt to inaugurate such a system at present in view of the very large expenditures that would be necessary and in the face of the wartime shortage of man power. It was generally agreed that if universal registration were to be undertaken there ought to be definite assurance of sufficient funds and adequate personnel to do a thorough and accurate job. Experience elsewhere, notably with the Canadian National Registration of 1940, has amply demonstrated the futility of doing a half-way job. So for the present a nation-wide system of continuous population registers appears to be out of the question.

Interpolation or extrapolation from crude census data is the cheapest, easiest, and often the only available method of estimating the population for inter-censal or post-censal dates. For purposes of inter-censal estimation the choice of a mathematical function to describe population growth does not present very great difficulties. If the population is fairly stationary the errors which may be introduced by application of one function rather than another are small in comparison to the inaccuracies of the census data themselves; if the population is growing or

declining rapidly the chances are that the fluctuations of its growth from time to time will outweigh the errors arbitrarily introduced by any particular mathematical formula. For example, the population of the city of Los Angeles more than doubled between the censuses of 1920 and 1930. Yet the relative discrepancy between interpolated estimates based on arithmetic and geometric increase reached a maximum of only 8 per cent in the middle of the decade. On the other hand, in extrapolating trends beyond the last census date, the selection of a function may introduce serious and rapidly increasing discrepancies. Again taking Los Angeles as an example, projection to 1940 of the geometric rate of increase observed in the preceding decade yields an estimate 30 per cent greater than projected increase on an arithmetic basis and 80 per cent greater than the actually enumerated population. By 1950 the geometric estimate exceeds the arithmetic by nearly 60 per cent. Obviously it is unsafe to rely on either one, since some of the conditions which produced the rapid growth between 1920 and 1930 were undoubtedly transitory.

The logistic growth curve described by Pearl and Reed and validated by their experiments with fruit flies in milk bottles has an air of universal truth about it which might lead the unwary to apply it uncritically to the growth of any and all populations; but the authors themselves would disclaim any such indiscriminate use of their formula. They recognized that, although cities, counties, states, and nations are somewhat analogous to colonies of drosophila, there are some respects in which the comparison is invalid. Even in such large and relatively stable aggregates as whole nations, population growth refuses to conform always to any single formula. The more terms one introduces into the formula the closer the fit that can be obtained to observed data, but the weaker the *a priori* grounds for projecting the curve into the future. Smaller population aggregates such as cities and counties fluctuate even more wildly in response to the disorderly motives and whims of human beings.

Somewhat more dependable but still arbitrary estimates of post-census population growth can be derived by what we may call analytical and synthetic methods of projection. If adequate records are kept of births, deaths, and inward and outward migration, it is obviously possible by simple addition and subtraction to determine how much the population has changed since the last census. This procedure is applicable to the United States as a whole but not to any of its subdivisions, because comprehensive internal migration data do not exist. The well known estimates of Thompson and Whelpton are derived by applying age-specific birth and death rates successively to the known population at a census date and to the computed population at subsequent dates. Allowances can be made for anticipated increases and decreases in the specific rates and for assumed volumes of net migration.

Again, this method of estimation can be applied with greater confidence to the entire nation than to individual states or cities because in the case of the latter not only net migration but also nonresident births and deaths are imponderable elements. As Thompson and Whelpton have taken pains to observe, their estimates, like those based on some general empirical growth curve, are strictly speaking not predictions of the actual population at future dates but rather computations of what that population would be if certain explicitly assumed conditions should prevail. In this sense they are very useful instruments for anticipating the possible results of given conditions. They do not provide a satisfactory base for com-

puting vital rates, nor can they indicate to a public housing administrator, for example, how many houses are needed or will be needed at a given time.

Sampling enumerations of population have the advantage of being much cheaper than complete canvasses and can serve some purposes just as well, but there are definite limitations to their use. Some time ago the Bureau of the Census formulated detailed plans for nation-wide annual sample censuses of population, to supplement the complete decennial censuses. The project, like many others, has become at least temporarily a casualty of the war. Assuming that a sample of between 1 and 5 per cent of the population were to be canvassed, it would be possible to obtain very reliable figures for the country as a whole and for very large cities or other areas with a large aggregate population, but those changes in the population of small areas which are often of crucial practical importance would not be measured. A couple of years ago plans were also drawn for a special census of the Washington, D. C., metropolitan area, using a considerably larger sample. This project also failed to materialize.

The Monthly Labor Force Survey, initiated in 1939 by the Work Projects Administration and now carried on by the Special Surveys Division of the Bureau of the Census, is a notable example of the use of so-called stratified sampling to obtain estimates for a large population—in this case the entire labor force of the nation—by canvassing a relatively very small sample. Based on returns from small numbers of households in 64 counties, the results of this survey may be regarded as indicative of nation-wide conditions, but it is impossible to derive estimates for smaller areas.* Sample censuses of Chicago and the State of Michigan were made in the mid-1930's under the auspices of emergency relief agencies. One of the hazards involved in applying random sampling to census-taking was illustrated in the latter project when a supervisor discovered that one of his canvassers who suffered from an inferiority complex avoided ringing the doorbell of any brick house and always visited the next wooden house instead. Another large-scale application of sampling to population estimation was the series of studies of in-migration to some 70 centers of defense industry made by the Work Projects Administration in 1941 and 1942. The coverage of these surveys usually included a random sample of dwellings throughout the city and a more intensive canvass of low priced hotels, tourist camps, and the like.

In general, it is easier to derive from sample canvasses frequency distributions of population characteristics than it is to determine the absolute size of the population. By the application of probability theory it is relatively easy to determine in advance how large a sample will be needed to yield sampling variances within predetermined limits, but no amount of mathematical theory can assure the selection of a sample which is truly representative of an unknown stratum of the universe.

Stratified sampling (or, to use an etymologically less inept term, purposive sampling) is for many purposes more efficient than purely random sampling but it can be properly used only if the dimensions of the various strata or segments of the universe are fairly well known in advance. Thus, for instance, this method is not very well adapted to estimating the population of a community which has been undergoing rapid change.

To meet the inescapable need for some kind of local population estimates in the absence of a recent general census and if a special sample census is not

* A new sample design was adopted late in 1943.

feasible, recourse is often had to various series of data which are collected for other purposes. Among the more commonly used sources are the following:

School enrollments and censuses of school children—The number of children unfortunately bears no constant ratio to the total population and this ratio is most likely to be abnormal in precisely those rapidly changing communities for which current population estimates are most urgently needed.

City directories—These customarily list adults only. City directory listings are sometimes used in conjunction with school census data, each supplementing the other.

Voting lists, tax assessors' lists, and lists of public utility customers—All of these are selective and especially likely to omit persons who have recently moved into a community. They are also subject to more or less expansion and contraction with changing economic or political circumstances.

Registrations for ration books—Registrations of consumers for food rationing provide at present the most nearly satisfactory nationwide source of current population data. Certain categories of persons have been excluded from receiving food ration books. These include members of the armed forces (except those who do not eat at organized messes) and inmates of institutions. It is possible, in most cases, to obtain fair estimates of the latter from other sources. The Bureau of the Census has published estimates of the civilian population of each county on the basis of registrations for War Ration Book 1 as of May, 1942, and is preparing similar estimates from the records of distribution of War Ration Book 2 as of March, 1943. War Ration Book 3 was distributed last summer through post offices, and applications for this book have been filed in such a manner as to make it impractical to derive population estimates for counties or other political subdivisions. Applications for War Ration Book 4 which were received in October, 1943, will provide the basis for a new set of county population estimates. Heretofore only the total population has been estimated from ration book registrations. In connection with the distribution of Book 4, however, plans have been made for sample tabulations of age by sex for selected areas which are known to be congested or to have experienced unusual population growth. These tabulations are to be made by the Bureau of the Census directly from the original application blanks which will be shipped to Washington from the selected counties. Although no plans have been made to do so, it would be possible also to extract data on the sizes and the age and sex composition of family groups.

CONCLUSION

This survey of methods of estimating population should indicate that it is difficult, especially in wartime, for the central government to provide data which will meet all local needs. Local needs are varied and frequently urgent. The Vital Records Commission, after discussing the potential usefulness of a national registration scheme to the federal government, observed that it would be of even greater value at a local level than for the nation as a whole.

Undoubtedly, a system of continuous population registration would provide a local community with more adequate current information about its population than could be obtained by any other means. While it has been determined to be unfeasible to undertake nationwide registration under present conditions, perhaps the registration officials of some unusually self-conscious and civic-minded communities might try to enlist the support of other local officials for some experiments along this line. If the obstacles to establishing a local register are overwhelming, it might be possible at least to develop other procedures for obtaining periodically better indications than now exist of local population changes. Such experiments might serve as models to be gradually copied throughout the country or as horrible examples to be avoided. At present we have not enough of either.

Few successful managers would dream of running a business without maintaining continuous inventories of their stocks in trade; the time is past when the affairs of a community could be well conducted without knowing of how many and of what kinds of people it is composed. Here is a challenging opportunity and need for registration

officials of cities and states to look beyond their traditional function of keeping birth and death records, and to pioneer in developing better systems of population accounting.

In this pioneering they should enlist the support of numerous local official agencies and community organizations. Various federal government agencies would, I am sure, be glad to assist with technical consultation, but local initiative is greatly to be desired.

DISCUSSION

GRACE C. SCHOLZ

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MR. SIBLEY'S summary of methods of population measurement and estimation leaves little to be added. I believe that the most pertinent comments that I can make deal with the most recent available sources of data which serve as bases for population estimation, that is, the national registrations of consumers for War Ration Books.

As has been done in Books One and Two registrations, figures, by county, obtained from Book Four will be compiled by the Office of Price Administration. Issuance subsequent to initial registration and the surrender of books, as reported monthly, will be used to adjust the initial registration data and subsequent releases issued. In addition, to supply the demand for data at the local level, the Bureau of the Census will tabulate age and sex distributions for the civilian population of all cities of 50,000 and over, and for a number of rural counties which have been selected as critical areas by government agencies whose operations will be aided by having such information available. Approximately 500 counties are included in those selected, and sample tabulations will be made for about 300 areas, some areas comprising several counties. This will be done on the basis of application forms for Book Four which, for the counties selected, will be forwarded to the Bureau of the Census. It is also contemplated that certain family data be tabulated in selected areas if technical methods can be found to determine family composition from data listed on the application forms.*

As Mr. Sibley has pointed out in discussions with representatives of the OPA, although I do not think he has mentioned it in his paper, national estimates of age distribution and sex distribution are better obtained from other available sources than this ration book registration, even though estimated from less current data. On the other hand, data for critical local areas cannot be accurately estimated from less current information, because of the very factors that make the areas critical, e.g., recent large scale population shifts.

The OPA has sought, since the time of the Sugar Registration, that is, the War Ration Book One registration, to confine its requests for information from the registrant to those items incidental to the registration and necessary to the administration of its various rationing programs. Registration data within the OPA have served a number of administrative purposes. County figures have been used as the basis for dis-

* Some doubt has arisen as to whether all of these tabulations will be completed. Present indications are that only figures on age-sex distributions for a number of selected areas will be made available.

tribution of ration forms, probably the largest distribution of printed material that has ever been undertaken. Allotments of sugar, processed foods, and meat are made to industrial users on a basis which utilizes county registration data in its computation. In budgeting for field and local board OPA personnel, county registration data supply one guide by which size of staff is regulated.

When the OPA requires statistical information, as, for example, age-sex distributions in local areas in any of its rationing programs, this requirement is always duplicated by another government agency—the agency that will direct the OPA to ration that commodity. For example, if the OPA should be directed to ration milk, it will require age-sex distributions of the population in the areas to be rationed. This same information is now required by the War Food Administration.

Registration data have not always been issued to the public, but they have always been made available to those government agencies requesting them. When registration counts have been issued by OPA they have always been accompanied by the admonition that these registration data were not population figures and should be properly interpreted or qualified in their use. Particularly, they have been supplied to the Bureau of the Census in order that that agency, through its established facilities, might properly use them to serve as the basis for civilian population estimates.

There are a number of reasons why registration data cannot be assumed to represent civilian population data. These reasons can be divided into two groups—those that affect the initial registration figures and those that influence current data, that is, data corrected for issuance subsequent to initial registration and surrender of books. In the first group the following may be mentioned:

1. War Book Registrations have been associated in the public mind with specific commodities, e.g., Book One was associated with sugar and there was little incentive for people having no use for sugar to register, until Book One became a requisite for Book Two. Book Two was associated with processed foods and we may assume that until Book Two was also used for meat there were some persons who did not make application for it. Book Three was associated with the continuing need of stamps for meat and for the next shoe stamp. There is an increased incentive to acquire Book Three since it has been announced that it is a requisite for Book Four. Now that the plan for use of tokens has been generally discussed, and it is probable that Books Three and Four will be made to last for several years, there is strong inducement to acquire both, even though no one commodity has become associated in the public mind with Book Four.

2. Differences in definition of institutions by the Bureau of the Census and the Office of Price Administration make difficult the determination of the size of the group of institutionalized persons who do not apply for War Ration Books.

3. Members of the armed forces not eating in organized mess were excluded from the initial registration for Book Three, although that group was included in the initial registration for Book Two. The size of this group has been roughly estimated at 400,000.

4. Registrations have been conducted at a time characterized by population movements making for faulty initial registration and increased late registration, and that late registration not always at the place of residence.

5. So much of the completeness of registration at the local level depends on the competence of the rationing and registration machinery and on the effectiveness of the publicity given the

registration, that there is bound to be considerable variation from county to county. The dependence on field operations in the registrations has varied. Book One issuance was entirely centrally controlled; in Book Two more opportunity for local planning was permitted. Book Three was almost entirely distributed according to a national office plan, while Book Four again becomes a schoolhouse registration but with considerable latitude for field planning in its distribution (each of the administrative regions of OPA established its own plan for distribution in accordance with certain broad outlines established by the Washington office).

The maintenance of currently correct registration data is dependent upon an accurate knowledge of late issuance of War Ration Books, of births, and of surrender of ration books due to entrance into the armed forces, death, or admission to an institution (e.g., mental hospital or prison). The attempt to collect surrendered books has not been too successful so far in spite of the efforts of a number of organized groups. However, every attempt is being made to improve the machinery by which books are surrendered. Because of the incompleteness of current registration data, in the case of War Ration Book Two, the public release of late issuance data, on the advice of Census experts, has been stopped as of April 1.

While registration figures for War Ration Books may serve to supply certain estimates of civilian population in the country as a whole, or in smaller areas, they could not supply even a portion of the detail that a national registration system such as that proposed by the Vital Records Commission would furnish. While it would be unwise not to make all possible use of whatever registration data may incidentally be provided by administrative needs, such a registration must serve primarily the purpose for which it was initiated. A War Ration Book registration does not provide a particularly good vehicle for collecting statistical data, but until a better one of equally recent date is provided, it must serve as best it can.

American Journal of Public Health
and THE NATION'S HEALTH
Official Monthly Publication of the American Public Health Association

Volume 34 February, 1944 Number 2

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OLD NOSTRUM RIDES AGAIN

FOR some reason or reasons, perhaps connected with public psychology in war or in some way related to the burden of taxes, radio has rejuvenated patent medicines. In a great many of the better spots of the better broadcasts one is assailed by authority-timbred tones which bid the public strengthen itself with some special brand of vitamins or which emphasize the value of a particular panacea that, because it is like a shotgun prescription, will remove hair or curl the whiskers, as the sex might be. Or again the same long-suffering public is exhorted to purify its blood, to waken its liver, to unclog its nostrils, to move its bowels. Often too, these succulent radio voices add a touch of mystery and dignity by the mouthing of chemical terms. They set forth anatomical relationships clearly enough to be understood by a child but not by an anatomist; and too frequently an amazingly simple physiology is inferred. Torch singers and sopranos take up the refrain and drag into millions of living rooms little songs and jingles, some of them very catchy too, all to the glory of self-dosage; and often it is only through the courtesy of some proprietary that one gets spot news or good music or a thrilling drama of the air. Some of these radio prescriptions are new and sail confusingly in the wake of modern science. Others are so hoary in their iniquity that the medical profession was under the impression they had been laid to rest by federal laws as to claims and labels, and newspaper ethics as to advertisements. But they live again on the radio: cut a little smoother and thinner, but the same old sausage.

Regardless of the particular proprietary that sponsors and irrespective of the broadcasting company, or of script writers, performers and announcers, there is a strong tendency in most programs to lead listeners so easily and pleasantly down the path of self-diagnosis that self-treatment seems quite logical; and the uninitiated can hardly wait to get to the drugstore. From an advertising standpoint, no doubt, such an outcome spells shining success: there is something to be sold, and by the eternal, it is being sold; and the contracts go rolling along. But from the standpoint of the medical profession and of those interested in the public health this radio-nostrum alliance is a discouraging and alarming phenomenon. How or when the situation may be rectified, no one knows, for both interests are powerful. The radio industry is literally bursting at the seams with vigor and ambition, possessing in full measure both the promise and crudeness of youth. It is

apparently willing and able financially to fight for what it believes to be its prerogatives, and judged on the basis of past programs, these prerogatives include the right to further in the United States a patent medicine guzzling citizenry. The patent medicine industry for its part is no babe in the woods when it comes to taking care of itself. It knows just where effective pressure may be put and just how to put it; it knows just where the legal ice is thin, and, correspondingly, it knows where it may safely do a therapeutic razzle-dazzle.

For the above reasons and others, one may not hope for any early restrictions in radio advertising of patent medicines. It is too profitable an alliance for any of the high contracting parties to permit the public to " infringe " and, further, it is tied up with that reform-defying, resistance-smashing and magic institution, Commerce. And ladies and gentlemen, when majestic Commerce enters into any situation the lowly and poor relations of government and society had better seek shelter, for public health history is replete with records of the pressures that commercial interests can bring, such as denial of the presence of an epidemic or insistence upon the right to sell inferior goods, including drugs, to the unsuspecting at home and abroad. Legislators, health officers, physicians, and others interested in the public welfare have thus learned that in any clash between public health and Commerce, the public is willing to take a long and thorough drubbing before it rises in its wrath. Fortunately, but usually at long last, the Right may hope to prevail. In the meantime, and in the present radio patent medicine situation, one is inclined to ask, " How long, O Lord, how long? "

And not the least distressing part of the situation is that these patent medicine shows, in their radio excellence, put to shame the sincere but nevertheless dull efforts of conventional health education.

TWENTY-FIVE YEARS OF FRUITFUL PHILANTHROPY

THE Commonwealth Fund, which was founded just before the Armistice in 1918, reviews its experience from war to war in the *Annual Report* for 1943. It is not only because the Fund has spent $41,000,000 " for the welfare of mankind " during this quarter century that it has significance for the public health professions. In quantity that is no mean sum. In emphasis it represents a special concern with public health, for $28,000,000 has been expended for the physical and mental well-being of the race.

It was a former President of the Rockefeller Foundation, Dr. George E. Vincent, who, when asked to justify the investment of a major portion of income in public health activities, declared that this field held a supreme advantage because one could measure the results with reasonable precision. The Commonwealth Fund has not neglected the critical testing of its health enterprises. Through the auspices of the Fund the late Dr. W. Frank Walker made his distinguished contributions in the realm of appraisal.

Giving away money has its own problems and pitfalls. Long ago Horace said, " Money is a handmaiden, if thou knowst how to use it." A giver need not deal in millions in order to appreciate the candor and the objectivity with which this report appraises the Fund's changing program and its effort to achieve " that middle course between the inflexibility of fixed endowments and the inconsequentiality of random giving." The flexibility of this program is well shown by the frank evaluation of the Fund's early large scale adventure which took the form of a series of demonstrations of child health services as part of the local

public health program. These demonstrations "set a pattern for a few good local health departments," but "on the whole they were disappointing as instruments for the improvement of public health service."

The Director declares that, in spite of the imperious demands which war makes on givers, the special function of foundations is to put money at work at slow, constructive, undramatic tasks that look to the future rather than to the immediate present. Few better statements are on record of the place for this kind of institution, the American foundation.

Besides the war service and foreign relief expenditures, which were sizeable at the beginning and at the end of the twenty-five year period, four major groups of activities are notable in the record. They are health services, medical research, mental health, and international fellowships. In these groups the contributions of the Fund show trends generally upward in the first two activities by five year periods. Contributions to mental health are declining; the British Fellowship program has been suspended for the duration of the war; the Fund is now offering a limited number of fellowships in medicine and public health to Latin American countries. Commendable is the determination to publish in some detail the purposes for which all grants were made. This is an obligation which a private trust certainly owes to the society which allows it to exist and is a policy which might well be emulated by all similar foundations.

"The Fund has been interested for many years in tools by which local health work can be appraised and guided. Through the Committee on Administrative Practice of the American Public Health Association and through its own Division of Health Studies it aided in the development and application of the *Appraisal Form for Local Health Work*, used first as a formal yardstick of public health performance and later as a mirror by which the health department could see its own progress or retrogression from year to year. Whatever the metaphor, such a device needs frequent adjustment, and it has now been refashioned in a form which promises even greater usefulness. During the past year 134 local health departments have reported to the American Public Health Association their statistical performance with respect to a carefully selected group of indices, e.g., percentage of children under five immunized against diphtheria, percentage of infants under nursing care seen within one month of birth, percentage of contacts on the tuberculosis register examined by x-ray, and so on. These reports are then charted so as to show, for any particular index of accomplishment, the upper and lower quartile and the median, so that any given health department can compare its own record with that of the group as a whole, confident that the standard so fixed is in no sense arbitrary but an actual reflection of current practice. Large and small health departments are differentiated on the chart so that due allowance can be made for variations in working resources. All the statistical work on this material has been done in the Division of Health Studies and the first year's output, prepared in simple and inexpensive form, has been widely distributed and warmly received."

Other coöperative ventures between the Fund and the Association include the series of state health studies conducted during the last six years by the Committee on Administrative Practice, with assistance from the Fund, and the work of the Subcommittee on Local Health Units which, for the first time, is obtaining the facts wherewith the overall picture of health unit structure in the United States may be drawn. These are the slow, constructive, undramatic tasks to which the future belongs. There is food for thought and reason for hope in this report.

Credit Lines

A Suggestion for Good School Health Programs

This statement by Dr. John Oppie McCall, Director, Murry and Leonie Guggenheim Dental Clinic, New York City, is based on notes made at the Workshop of the School Health Section on October 12, 1943, at the time of the Association's Wartime Conference and 72nd Annual Business Meeting.

The object of education is the total development of the child. In this his health is just as important as his grasp of arithmetic, geography, etc., and must receive equal attention from the school organization.

Health care of the school child requires health education and health testing and, in addition, emergency care. Since all of these activities will be carried on in the school, the Board of Education must see to it that they are carried on in a proper manner—must, in a word, have over-all charge of administration. Since this is a branch of public health service, the planning and execution of the health services mentioned must be developed in coördination with and have the approval of the local public health authority and reflect the best judgment of the medical, dental, and nursing professions. To achieve this coördination of professional authority a school health advisory committee may be organized by the school administrator.

Health services in the school must meet three criteria: soundness, economy, and availability when needed. Utilization of the classroom teacher as an integral member of the health team is needed to satisfy these criteria.

This implies that the teacher, both in her professional training course and in subsequent in-service training, shall be indoctrinated with the concept of the importance of child health, placing it on an equal footing with the usual classroom exercises.

At a time when the present primary and secondary school programs are under fire and are considered to be in need of modification, the introduction of this broader concept of education is timely.

It is the classroom teacher who sees the child every day and throughout the school day. She is the first to see signs of incipient ill health, such as rashes, undue listlessness, etc., to detect evidence of faulty vision or hearing, or other defects. She may properly apply certain screening tests so as to conserve the time of nurses and physicians. This means that she should be trained in the science and art of health care procedures to an extent that may be agreed upon by joint action of medical and educational authorities.

Screening tests which the teacher can make with a modest amount of training include: vision testing, audiometer testing, dental inspection. To do these things properly requires that she should be given, during her course, a certain amount of fundamental biologic instruction such as is used as an introduction to the nursing course, e.g., anatomy and physiology, both general and of the eyes, ears and teeth, chemistry of the body tissues and foods, nutrition, bacteriology, and hygiene.

Health education enters into the picture as well. Health education is a sterile thing unless applied in practical everyday life. The school has an opportunity and an obligation to vitalize it. Daily health inspection by the teacher,

implementing the course of instruction in this subject and supplemented by special testing at appropriate intervals, provides the basis for such vitalization.

With the type of training indicated here the teacher will watch the health of her pupils, will know when to refer them to the school nurse for further evaluation. The nurse in her turn will decide when the child needs medical attention. Neither the nurse nor the physician need have his time taken up unnecessarily. The teacher will keep and file with her other records the primary health record of the child, making notations when reference has been made to nurse or physician.

The need for universal medical examination will vary, being influenced by general health levels in the community, occurrence of epidemics, etc., as well as availability of personnel. The time and energy of professional personnel should therefore be allocated on the basis of need rather than to have an invariable stereotyped pattern (annual examination) followed. However, annual dental examination by dentist or dental hygienist is needed because of considerable annual increment of dental caries.

FACTS ABOUT NURSING, 1943

One wishes that as many facts about the public health profession could be brought together in as convenient a compendium as the Nursing Information Bureau of the American Nurses Association has done in the booklet *Facts About Nursing, 1943.* Almost anything you want to know about nursing can be found therein. The number of nurses in the country, the number serving with the armed forces and in federal nursing services, the number of student nurses enrolled in nursing schools, the number graduated, student withdrawals, tuition fees—all these data are assembled. There are sections on private duty, hospital, and institutional, and public health nursing; the American Red Cross Nursing Service and military nursing. Useful tables occur unexpectedly, like the one on enrollment in Blue Cross plans at the end of the hospital section, and like the cost of living table satirically and thought-provokingly included after the figures on working hours and salary ranges. The National League of Nursing Education and the National Organization for Public Health Nursing coöperated in the compilation. Copies of *Facts About Nursing, 1943* may be obtained from the Nursing Information Bureau, American Nurses Association, 1790 Broadway, New York 19, N. Y., at 25 cents each.

PUBLIC HEALTH IN NEBRASKA

The Nebraska Health Planning Committee, an unofficial organization made up of representatives of farm groups, urban organizations, University of Nebraska, and official representatives of the State Medical and Dental Associations, and the State Department of Health, has done an interesting interpretive job on Nebraska's recent health legislation. Under the title "LB 295 Gives the Green Light to Local Health Departments," it outlines in lay language and by way of 26 questions how localities may go forward in providing necessary public health service under the terms of the act which permits single or multi-county health units. One of these questions is "How Would a Local Health Department Serve My Family?"

The question "How Would District Public Health Units Be Determined?" is answered as follows: "In drawing up their own health districts local citizens may . . . find valuable help in the recommendations of the American Public Health Association." The committee then outlines briefly the June, 1942, resolution of the American Medical Association on local health service,

the setting up of the Subcommittee on Local Health Units of the A.P.H.A., and summarizes the recommendations of this committee as to size, area, combination of urban and rural areas of counties, and ratio of physicians and general hospital beds to population.

Answering the question whether every county may have a health department, the Planning Committee says "A county with a population of less than 60,000 should not attempt to set up a county health department unless the assessed valuation of property is sufficient to raise the necessary funds for the county share of the support of the local health department. For purposes of administrative efficiency and economy the majority of counties will find it most satisfactory to pool their financial resources with one or more adjoining counties to set up district health units."

This recommendation would appear to be approval in a very real and practical way of the 50,000 population set by the Subcommittee on Local Health Units as a minimum able to justify and afford adequate full-time health service, since only two of Nebraska's 93 counties have populations of over 60,000.

HEALTH PRACTICE INDICES

The Committee on Administrative Practice of the A.P.H.A. reports that its new publication *Health Practice Indices* is being very well received. Following the initial distribution to state and local health departments, about 800 copies have been sent out in answer to requests from health departments, health associations, other agencies and individuals scattered over 40 states and Canadian provinces.

Excerpts from the various comments received from state, city and county health officers are presented for interest.

"This booklet contains a world of helpful information."

"It is an excellent booklet and provides a method whereby we may evaluate our services in the community."

"I am very much pleased with the copy of *Health Practice Indices* which you sent me. I should like to have copies of it for our 23 county health officers as well as our bureau chiefs."

"We believe that a study of these findings by a carefully selected group of individuals in our own community would be very helpful."

"We would like very much to become part of a reporting area for health practice indices."

"It is an excellent handbook for health officers. It quickly points out the weak spots in one's own program."

"I found the material very instructive and interesting. Would it be possible for us to obtain about 200 copies?"

"It is my purpose to use my figures and then try to approximate the line in order that I may compare my city with others. I plan on lantern slides so that I may use them in talks."

"The development of a national reporting system would be a significant improvement to public health practices. Locally the 'Indices' will be a real aid to the health officer in stimulating higher health standards. In a community with a new health department like ours, people are very pleased to hear that there have been no cases of smallpox in the last five years, but the fact that only 20 per cent of children below five years are vaccinated makes no impression on them. Or when we tell them that only 65 per cent of our people drink pasteurized milk they smile and say: 'Why that is wonderful, five years ago nobody drank pasteurized milk.' By showing them where other communities stand I think that the shocking index of the community can be raised."

The committee plans to study the use of the Indices in the field and assist in securing increasing accuracy in recording. Following the receipt of the 1943 *Evaluation Schedules* in March material will be assembled for the second issue of *Health Practice Indices*. The new booklet containing the 1943 experience will present material in the form used with most of the previous charts together with charts of information not previously included. An effort will be made to release this publication some time in August.

TIME SAVING TIP FROM A COMMONWEALTH FUND NEWS LETTER

"Dr. Frank L. Roberts, professor of preventive medicine at the University of Tennessee, who visited Mexico and Guatemala last summer on an advanced fellowship from the Fund, tells in his report of a village in Vera Cruz which recorded an astonishing number of deaths from lepra (leprosy). The state health officer investigating the matter found that the local registrar had formed the convenient habit of ascribing all doubtful deaths to lepra because that was the shortest word in the official list of causes of deaths."

DISEASE OUTBREAKS IN THE UNITED STATES CONVEYED THROUGH VARIOUS CHANNELS

The States Relations Division, Sanitation Section, of the U. S. Public Health Service, Washington, has recently published four reports which describe respectively disease outbreaks conveyed through water, through milk and milk products, through foods other than milk and milk products, and through undetermined vehicles in the United States in 1942. These are according to reports by state and territorial health authorities and by certain city departments of health. These tabular statements gather together in one reference a considerable number of outbreaks. The report on water (A-1) records 6 outbreaks of dysentery, 37 outbreaks of gastroenteritis, and 9 outbreaks of typhoid fever. In the milk report (B-1) there is apparent a lack of uniformity in diagnoses as between food poisoning and gastroenteritis; 2 outbreaks of scarlet fever, 4 of septic sore throat, 5 of typhoid fever, 5 of undulant fever, and 1 of diphtheria (possibly conveyed through milk) are reported. The report on foods other than milk and milk products (D-1) includes 7 outbreaks of botulism, many food-poisoning and gastroenteritis outbreaks, 9 outbreaks of trichinosis, and 4 of typhoid fever. Epidemiologists seeking to understand the relative importance of outbreaks associated with these various channels will be interested to study these reports.

THE NATIONAL ASSOCIATION OF MANUFACTURERS SPEAKS UP ON INDUSTRIAL HEALTH

No less an authority on what is good for business than the National Association of Manufacturers marshalls facts and figures to show that an industrial health program "pays" in terms of dollars and cents for the small as well as the large plant in peacetime and in war. The arguments are presented as part of a comprehensive study entitled "Health on the Production Front" by Victor G. Heiser, M.D., Medical Consultant for N.A.M. "The annual net profit to the average plant of 500 employees," Dr. Heiser says, "from the operation of a health program is $5,611," while "the yearly loss to a company of 500 employees which operates without a health program may be seen to be $39,900."

The information in "Health on the Production Front" of which the chapter "Do Good Working Conditions Pay?" is only a part, is keyed to the small plant, since as Dr. Heiser says, the problem of providing a health program for the small plant (fewer than 500 employees) has been "baffling," though the small plants of the country employ about 60 per cent of all industrial workers, now estimated to number 20,000,000.

There are four major divisions in the booklet: "Health of the Individual Worker," "Hygiene of the Working Environment," "Do Good Working Conditions Pay?" and "Special Subjects." Dr. Heiser begins by quoting the standards of the American College of Surgeons for industrial medical service, and proceeds to illustrate how

the small plant can set up a health program, applying the standards. He provides a good summary of modern industrial preventive and therapeutic practices with proper emphasis in the former on health education, nutrition, and mental hygiene. Atmospheric, sanitary, and safety engineering are each given attention as part of the hygiene of the environment. Women in industry, absenteeism, recreation and morale, and rehabilitation are discussed in the special subjects section. A check list of industrial health practices is included for purposes of self-appraisal.

FREE NATIONAL SAFETY COUNCIL PUBLICATIONS OF SPECIAL INTEREST TO PUBLIC HEALTH WORKERS

Safe at Home. A 24 page booklet on home accident hazards. Current edition issued in January, 1943.

Fight the Axis in Your Home. Brief, bright and snappy home safety leaflet. Published, Spring, 1943.

He's Afraid of the Man With the Hoe. Four page farm safety leaflet. Published, Spring, 1943.

Home and Farm Safety Guides. Single sheets of safety information on 56 home and farm operations. Prepared during the period January through November, 1943.

MALARIA CONTROL DRAINAGE IN MISSISSIPPI

The Mississippi State Board of Health has published a brochure called "Malaria Control Drainage, A Guide to the Public Health Worker, Landowner, Farmer, City Official, County Supervisor, and Others Interested, Containing the Answers to Many Fundamental Questions on Minor Drainage." This is a well illustrated handbook prepared for the use of persons without full technical equipment in the field of drainage and, as Dr. Felix J. Underwood, the Executive Officer of the State Board of Health, remarks, the material should have a wide application throughout the southeastern United States. The combination between good typography, good illustration, and a lucid text is indeed commendable.

LEAD POISONING AND BENJAMIN FRANKLIN

In December, a report of the Committee on Lead Poisoning of the Industrial Hygiene Section was published. "Occupational Lead Exposure and Lead Poisoning" it is titled, and, according to the Lead Industries Association and other reviewers, "thoroughly summarizes present-day knowledge" in regard to the recognition, control, diagnosis, and treatment of industrial lead poisoning. Present-day knowledge adds up to quite a lot, even to the conclusion that "recovery from lead poisoning is usually complete, leaving no partial or complete disability," and reminds us that this generation again is the beneficiary of centuries of patient observation, deduction, and reasoning fused into another weapon for our use in preventing and alleviating human misery.

Benjamin Franklin was a pioneer in the diagnosis of lead poisoning. In 1768, he wrote to Cadwallader Evans that he had long believed the disease to be due "to a metallic cause only; observing that it affects, among tradesmen, those that use lead, however different their trades; as glaziers, letter founders, plumbers, potters, white-lead makers and painters." Drawing on his own background as a printer, Franklin expressed in another letter the belief that lead poisoning among typesetters was due to the particles of metal swallowed with their food by slovenly workers who ate their meals without washing their hands. "The presence of vapors, or fumes, or fine dust of lead compounds in the air breathed by workmen is the most important factor in occupational lead exposure," says the new

Report, "however, lead compounds which contaminate the hands, food, tobacco, or other objects taken into the the mouth, may not be ignored as means of exposure, even though the conditions be such that these compounds are not disseminated into the air breathed by men."

COMMUNICABLE DISEASE REGULATIONS OF THE IOWA STATE HEALTH DEPARTMENT

The new volume of *1943 Rules and Regulations for the Iowa State Department of Health Relating to Communicable and Other Reportable Diseases* has been received. This volume is notable among those of similar nature published by state departments of health. Among other features, there is included a graphic chart showing the course of various reports required of physicians and others in the state of Iowa.

Section XV on the Control of Communicable Diseases incorporates the American Public Health Association's report on this subject, which is official with the Association and with the U. S. Public Health Service. While it is not unusual for this report to be approved in principle by state departments of health as a guide for the control of communicable disease, this is, so far as known, the only instance in which this report has been included verbatim as a section in the regulations, together with the introductory material. In spite of the fact that this A.P.H.A. report was not set up in the usual form for regulations in a state department of health, it lends itself rather well to this use.

Section XIII of the regulations on the closing of schools represents a forthright attempt to state the circumstances surrounding this measure and, because of certain unique features, is hereby quoted in full.

"On the outbreak of an epidemic, there is often a popular demand that the schools be closed. This is based upon the belief that infection may spread among the children in attendance. It is noteworthy, however, that health authorities and the Rules and Regulations of state departments of health in general omit any recommendations that schools be closed. The reasons for this are:

"(1) Children in schools are under more careful disciplinary control than they are in their homes. With effective supervision by the health officer and with the aid of a trained and experienced community nurse, in coöperation with school officials and the pupils themselves, the children are safer at school than outside.

"(2) Closure of schools is futile, unless all susceptible children are forbidden to leave their own yards. Permitting them to roam the streets, to attend the moving picture theatres, churches, social gatherings, or to indulge in unsupervised group play, may be much more dangerous from the standpoint of interchanging infection, than if they were under the discipline of the schoolroom.

"(3) Past experience has shown that the mere closing of schools has had little or no effect upon the progress of epidemic diseases. Unless, therefore, a community is prepared to declare a complete and rigid embargo upon all susceptible children of school age, isolating them universally to the limit of their own yards and absolutely forbidding them to play with children of other families, the SCHOOLS, ordinarily, SHOULD NOT BE CLOSED.

"(4) School boards, parent-teacher groups and other sponsoring agencies should concentrate on such efforts, year by year, as will assure immunity of children against diphtheria, smallpox, and other infectious diseases for which specific preventive measures are available.

"Parents are urged to confer with the attending physician and to have children immunized against preventable diseases early in life."

The Iowa State Department of Health and Dr. Walter L. Bierring, Commissioner, are to be congratulated on the format and the contents of this report.

BALTIMORE'S HEALTH SERVICE 150 YEARS OLD

One need not be an antiquarian to enjoy the December, 1943, issue of *Baltimore Health News*. Dr. Huntington Williams and his staff have selected

some excellent historical landmarks and the photostatic and photographic reproductions of original documents point up the record in a unique fashion. This humanizes history so all may enjoy it.

SMALLPOX PREVALENCE AND COMPULSORY VACCINATION

Considerable interest has been expressed in a study made by Franklin H. Top, M.D., and Laura E. Peck, R.N., entitled "A Small Outbreak of Smallpox in Detroit" (published in the May, 1943, issue, *A.J.P.H.*), in which the prevalence of smallpox has been correlated with the type of regulation enforced in each of the states relating to vaccination.

Health educators who are seeking to promote an interest in vaccination will wish in this connection to read the article by Brock C. Hampton of the U. S. Public Health Service on Smallpox in Relation to State Vaccination Laws and Regulations (*Public Health Reports*, Vol. 58, No. 49, December 3, 1943, pages 1771–1777).

The regular increase in the rate of smallpox prevalence in five groups of states selected according to the type of vaccination regulation, prompts the author to conclude: "The difference in the incidence of smallpox in the different areas of the United States is apparently related to the various provisions of law or regulation, especially with reference to the requirement of vaccination as a prerequisite to school attendance; it is apparent that smallpox is lowest in those jurisdictions which have some type of universal vaccination requirement."

UNION COÖPERATION IN CALIFORNIA

Reporting on the year's activities of the California Social Hygiene Association, Leo Arnstein, Executive Secretary, has called attention to several instances where union officials are exercising effective leadership in urging their members to have blood tests. The California State Federation of Labor by resolution is calling upon all unions to have new members blood tested on entering the union. Management, Mr. Arnstein states, has been surprised to discover the enthusiasm with which the unions have responded in plant-wide campaigns. In some cases, not only were the blood tests accepted with alacrity, but the unions also asked for chest x-rays for all their members. Seventy-five to 85 per cent of union members have been given blood tests in certain industries. This attitude on the part of California's unions could not have been established without good health education and good public relations by Mr. Arnstein's organization and the state and local health departments and agencies.

PRO AND CON OF WAGNER-MURRAY-DINGELL BILL (S-1161)

The public health profession has had access to numerous reviews of the provisions of Senate Bill 1161 proposed by Senator Wagner and his associates. Publications of the American Medical Association have carried critical analyses of the Bill and a review of public reactions to it.

Among relatively few reviews of the medical features of this Bill which are fundamentally favorable to the Bill may be cited the report dated December 30 of the Committee of Physicians for the Improvement of Medical Care, Inc. John B. Peters, M.D., is the Secretary in New Haven, Conn. Among other recommendations in this report is the proposal that it would be wiser to include at the start a smaller proportion of the population than the coverage of between 100 and 110,000,000 persons. Means are suggested for accomplishing this purpose. "Under a tax-supported system it would be possible to develop a program logically to

provide care first for those who lack it most, the truly needy, expanding it progressively to cover the whole population, either according to a prearranged time schedule or as experience and expediency warranted its extension."

The report points out that there is an ever-growing and wholesome tendency for hospitals and out-patient clinics to function as community health centers. A well organized and highly developed out-patient service, according to the report, is probably the finest existing example of the advantage of group medicine. The report recommends the development of such coördinated community services about a hospital. This will tend to prevent the unnecessary hospitalizing of patients for conditions that do not require in-patient facilities.

Health workers seeking to familiarize themselves with both sides of the current discussion will find the report stimulating. A copy can be obtained from Dr. Peters at 789 Howard Avenue, New Haven, Conn.

WORTH ACQUIRING

"The Medical Social Worker in a Public Health Department," published by the Bureau of Medical Social Service of the Los Angeles County Health Department, H. O. Swartout, M.D., Dr.P.H., County Health Officer. A series of three papers on the function of the medical social worker in the tuberculosis, social hygiene, and maternal health programs of a county health department.

"Approved Films on Food and Nutrition, 1944," a Selective Catalogue, published by the Committee on Evaluation of Motion Pictures, New York City Food and Nutrition Program, 45 Lafayette Street, New York 13, N. Y. (25¢.) This is the second list prepared by the committee, and summarizes and appraises 46 films. Full information with regard to producer, distributor, and terms of use is given for each. The committee acknowledges the coöperation and technical advice of Adolf Nichtenhauser, M.D., of the American Film Center, Inc., in the preliminary preparation of many of the film reports.

The December issue of "Tic," published by Ticonium, 413 North Pearl Street, Albany, N. Y. Contains a tabular review of selected prepayment plans for medical care sponsored by component groups of the American Medical Association, and a tabular summation of the Social Security Act and recently proposed amendments; also a description of the health education program of the American Dental Association and comments on the Wagner-Murray-Dingell Bill (S. 1161) from the dentist's standpoint, by Harry Strusser, D.D.S.

"Borden's Review of Nutrition Research" for December, published by The Borden Company, 350 Madison Avenue, New York 17, N. Y., devoted to "Nutrition and Vision-Vitamin A." "The relation of Vitamin A to the visual cycle is of more than academic or scientific interest. Its importance in night driving, in night flying and in general vision in subdued light . . . are strong and cogent reasons for the inclusion of optimum amounts of this vitamin in the diet."

"Penicillin, Merck, Its Actions and Uses," 24 page booklet with full color illustrations on the discovery, production, pharmacology, clinical indications, dosage and administration of penicillin, with a bibliography of 100 items. Published by Merck & Company, Inc., Manufacturing Chemists, Rahway, N. J. Incidentally, correct pronunciation of the name of this drug accents the third, not the second syllable, radio announcers to the contrary notwithstanding.

Series No. 7 of the Industrial Bulletin Board posters, published by the National Tuberculosis Association and distributed through state and local tuberculosis associations. There are

four posters in the series: " Stay home when you have a cold," " Don't spit! " " Germs hate soap," and "A full night's sleep makes you fit for a full day's work! " Materials on personal cleanliness and good health manners are in demand and these should be distinctly useful.

Venereal Disease Laws

Excellent progress was made during 1943 in the enactment by state legislatures of premarital, prenatal, prostitution and venereal disease control laws and amendments, Dr. Walter Clarke, Executive Director of the American Social Hygiene Association, said in announcing the results of a legislative survey just completed by the Association's Division of Legal and Protective Services.

" These various laws have the purposes either of protecting mothers and babies against syphilis, of enabling communities to take effective steps in the repression of prostitution, or of facilitating the finding, reporting, treatment and quarantine of infectious venereal diseases. It is encouraging that such solid progress has been made in this field even in the midst of war. Experience has proved that such legislation is an essential factor in maintaining a sound, smoothly functioning venereal disease control program."

The Association's survey shows that during 1943 the following social hygiene legislation was passed:

In Alabama a unique law was adopted which requires all inhabitants of the state between the ages of 14 and 50 to have an approved blood test for syphilis. An appropriation of $75,000 was provided to carry out provisions of the law.

The States of Indiana, Nebraska, Missouri, and Wyoming passed premarital examination laws requiring examination by the physician of both applicants for a marriage license including a blood test for syphilis as a prerequisite for a marriage license. Idaho, Georgia, Kansas, and Nebraska adopted prenatal examination laws for syphilis. This means that there are now 30 states which have premarital laws for the protection of marriage from syphilis and 30 states which have prenatal laws protecting babies from syphilis. The first premarital examination law was passed in May, 1935, by Connecticut, and the States of New York and Rhode Island enacted the first prenatal examination laws in 1938.

Arkansas, Florida, Georgia, Oklahoma, Tennessee, Texas, and West Virginia adopted new laws for the repression of prostitution, making a total of 19 states which now have adequate legislation against most of the aspects of prostitution. Ten other states have good legislation against prostitution with the exception of those provisions concerning the activities of customers of prostitutes.

The following states strengthened their venereal disease control laws, particularly in relation to the reporting, treatment, quarantine, follow-up, and finding of persons with an infectious venereal disease: Connecticut, Florida, Indiana, Maine, Maryland, Montana, New Mexico, North Dakota, Oklahoma, Oregon, Tennessee, Vermont, and West Virginia.

The premarital examination laws of

California, Connecticut, Illinois, Iowa, Massachusetts, and Vermont were amended by the legislatures to obtain more smooth operation. An interesting feature of the Massachusetts premarital law, as amended, permits marriage of applicants under certain conditions even though one or both may have syphilis in an infectious stage. The physician who discovers evidence of syphilis must inform both applicants to the marriage of the evidence and nature of such disease.

Two laws of special interest in this field were passed by the Florida legislature. One permits the revocation of a license of a boarding house, rooming house, hotel, and restaurant for any violation of the laws against prostitution, lewdness or assignation. The second statute requires all persons rejected or deferred from military service who are infected with venereal disease to report to the venereal disease clinics operated by the Florida State Board of Health or to take treatment from a private physician or at public expense.

In Oklahoma, the Governor signed H.B. 37 on March 18, 1943, relating to the examination and treatment of persons confined in public or private institutions, or any person arrested by lawful warrant for vagrancy, prostitution or other sex crimes for the purpose of determining if they are infected with syphilis or gonorrhea.

BOOKS AND REPORTS

All reviews are prepared on invitation. Unsolicited reviews cannot be accepted.

Criminal Careers in Retrospect—*By Sheldon and Eleanor Glueck. New York: Commonwealth Fund,* 1943. 384 pp. Price, $3.50.

The struggle of the aspiring theoretical science of criminology to achieve recognition among the applied sciences is yielding results, as exemplified in this volume by Harvard University's distinguished criminologists. It is the fruitage of a system of careful research and objective reporting that has only few contemporary rivals in any field.

The Gluecks commenced an intensive study of 510 adolescent offenders a little more than 15 years ago. The first two volumes (*Five Hundred Criminal Careers* and *Later Criminal Careers*) in the trilogy that comprises their report on these offenders spanned the two 5 year periods following the expiration of their sentences to the Massachusetts Reformatory, a congregate penal institution. This volume reports the follow-up on those careers in the last 5 year period.

During the last period as many as 439 of the original 510 were located, and they were subjected to a painstaking study of their traits, characteristics, and, among other aspects of their personalities and habits before and after they resumed life in a free world, of their contact with welfare and law enforcement agencies. The authors' object in assembling this material was to examine the nature of the offenders' behavior against the differentiated backgrounds thus revealed. A large percentage remained in the criminal ranks; a similarly large portion of the surviving group were re-arrested for other offenses, convicted, and again institutionalized. A relatively small group refrained from antisocial behavior.

Why did so many fail to respond favorably to traditional forms of penocorrectional treatment? Why did some reform and others not? What combination of characteristics conspires to prevent the emergence of law abidingness from anti-sociality despite punitive treatment?

These were the crucial questions with which the authors, patiently and fastidiously searching in this difficult field, were concerned. And it was to these questions that they sought answers of sufficient tested validity to justify the construction of prognostic devices (prediction tables) which might become utilizable in the delicate process of judging and treating differently constituted youthful offenders. The Gluecks caution us that their tables are experimental; indeed, their thoroughly scientific attitude toward the problem would justify no other approach. However, upon the basis of a meticulous investigation of environmental circumstances, family relations, economic responsibilities, work, use of leisure, and criminal conduct of a substantial group of such offenders, the authors believe that many factors in criminal behavior hitherto regarded as imponderables become more clearly defined; the presence of certain traits and characteristics in offenders militates against reformation except under versatile forms of social control; elements in the social, economic, and psychological histories of those engaged in criminality take on new significance when related to treatment procedures designed to fit the offender rather than the offense.

Those interested in the administration of criminal justice and in the elimination of ancient trappings in its peno-correctional system should discover here material infinitely helpful in the creation of reforms. Those who have undertaken the task of functioning in the preventive field would here be given useful tools with which to do their work. EDWIN J. LUCAS

Collected Reprints of the Grantees of the National Foundation for Infantile Paralysis—*Vol. III. New York: National Foundation for Infantile Paralysis*, 1943. 978 pp.

This volume consists of collected reprints of grantees of the National Foundation for Infantile Paralysis and covers roughly the period from September, 1941, through December, 1942. Although the subject matter of these reprints deals with poliomyelitis, the phases studied and reported cover many fields, such as anatomy, physiology, virology, clinical aspects, and the like. The volume does not lend itself for review purposes. For those workers specializing in public health and allied sciences, who are interested in poliomyelitis, it serves as a convenient means of keeping together a large number of papers on the subject. However, all papers on poliomyelitis are not included in this volume. There are both author and subject indexes.

FRANKLIN H. TOP

Clinical Diagnosis by Laboratory Examinations—*By John A. Kolmer. New York: Appleton-Century*, 1943. 1239 pp. Price, $10.00.

The primary purpose of this book is to present the applications and interpretations of laboratory tests used in clinical diagnosis. While a section of some 130 pages of the book is devoted to methodology of the simpler and more frequently employed procedures, it is relatively brief and is intended chiefly for illustrative and teaching purposes. The author has deliberately avoided an exhaustive professional laboratory manual. He has however, given instructions and precautions concerning the collection and preparation of blood samples, spinal fluid, cultures, etc., for various laboratory tests, including such details as the use of para-aminobenzoic acid in blood cultures of individuals receiving sulfonamide therapy, and several essential but all-too-often overlooked precautions regarding the avoidance of preservatives and procedures which interfere with, or completely invalidate, laboratory tests. Throughout the book physiological and pathological processes are discussed rather fully as the basis for interpreting results of laboratory findings; and various findings themselves are discussed in relation to the underlying principles of physiology and pathology. The style is remarkably concise and the information generally complete and authentic. There are some relatively minor errors and omissions, such as failure to mention monkey inoculations for diagnosis in yellow fever, although susceptibility of the monkey is mentioned. Statements concerning the rôle of *Staphylococcus aureus* in food *infections*, as distinct from food *poisoning* might arouse some controversy.

There are good discussions of the significance of various cytological and chemical findings in normal and pathological blood, and analogous descriptions of urine chemistry and microscopy, examinations of various other body fluids and exudates, toxicological tests, parasitological, mycological and bacteriological examinations, the hyper- and hypo-vitaminoses, endocrinology, etc. A section on intradermal tests includes several color plates of skin reactions. Most of these are excellent but those of the Schick test do not convey a very accurate idea of the pigment and scaling characteristic of the reac-

tion. The general applicability of the picture of the 24 hour reading on the Mantoux test might be questioned. The author correctly states that Mantoux readings should be made at least 48 hours after injection and are best judged by the amount of edema. In general the other illustrations, of which there are unfortunately less than 100, are well selected and of definite help. The inclusion of over 130 condensed tables containing summaries and data classified in relation to various pathological conditions, clinical problems, interpretations of laboratory data, possible sources of error, differential diagnoses, etc., should prove of inestimable value to students and to hurried practitioners. An extensive index adds greatly to the usefulness of the volume, as does the large table of contents, the latter covering some 32 pages. The 3 page introduction is particularly stimulating. The printing, editing, and binding are in the usual excellent style of the publishers. This volume will be of real value on any laboratory or office reference shelf.

MARTIN FROBISHER, JR.

Synopsis of Tropical Medicine—*By Sir Philip Manson-Bahr. Baltimore: Williams & Wilkins,* 1943. 224 pp. Price, $2.50.

The question of whether medical synopses ought to be encouraged has never been answered satisfactorily. The answer is probably that, if they are used by the right people for the right purpose and if the subject is a suitable one for compression, they have their place in medical literature. Sir Philip Manson-Bahr is one of our leading exponents of tropical medicine and the author of what is almost certainly the best single-volume textbook on tropical disease. Never has so much been compressed into so little so skillfully, as in his synopsis. Yet, the reviewer is even more than ever convinced that tropical medicine is not one of those subjects that lend themselves to this form of treatment. He is equally convinced that the book is not the ideal one for the medical officer in the Armed Forces, for whom it is avowedly written, unless this officer has already had a firm founding in tropical medicine and parasitology; in this case he will find it a very useful memory reviver. What this officer requires is not the disconnected highlights on symptomatology, parasitology, and treatment of innumerable tropical diseases, only a fraction of which he will be likely to encounter, but a handbook in the principles of malariology and tropical hygiene.

Nevertheless, the book does constitute a useful addition to the literature on tropical diseases, and will be prized and referred to frequently by those with a good knowledge of the basic principles of the subject, but who need certain specific data quickly. The bold captions make rapid reference easy, and, with few exceptions, the information given is accurate.

One cannot help admiring the comprehensiveness of each section. Very little of importance in the parasitology, symptomatology, diagnosis, and treatment has been omitted, and the range of subjects discussed is a very wide one; it includes all important tropical diseases, and most minor ones.

There are two general criticisms. The first is that the practical public health point of view is seldom faced; to suggest as a preventive measure for hookworm infection that "labourers . . . should wear well fitting boots and take antiseptic footbaths of 3 per cent salicylic acid in *ethyl alcohol*" may be sound advice when it is given in a consulting room in Harley Street, but it is scarcely a practical solution to the problem of the millions of hookworm sufferers in poor eastern countries. The second is that, to Sir Philip, pathology usually means little more than post-

mortem morbid anatomy, which is, to say the least, a pessimisitic attitude.

Two special criticisms will suffice; the omission of tetrachlor-ethylene, probably the drug of choice for the treatment of ancylostomiasis, must have been an oversight, but it is an unfortunate one, and the recommendation to give "2 grammes of typarsamide *thrice* weekly" seems dangerous.

It is not humanly possible to write a book that pleases everybody, but despite the intrinsic and incidental defects of this book, the reviewer does not believe that any living man could have written a better synopsis of tropical medicine. L. EVERARD NAPIER

Curriculum Problems in Health and Physical Education—*By Vaughn S. Blanchard. New York: Barnes,* 1942. 128 pp. Price, $1.50.

Health education and physical education in public schools now are undergoing changes which will help them to meet more effectively the needs and interests of children and youths. In making these changes it is important that teachers recognize the social and economic problems of the communities in which children live and the effect of these conditions of children. This point of view is well developed in *Curriculum Problems in Health and Physical Education.*

Following a discussion of the relationship of programs of health and physical education to varying concepts of the purposes and objectives of education, principles for guiding the construction of a curriculum are presented. The interests of children, their needs, racial factors, and environmental conditions are considered, as well as the importance of administrative provisions which make healthful living at school possible. Particular emphasis is placed on the curriculum for physical education.

For the help of those engaged in curriculum construction suggestions are offered for the preparation of units and for a curriculum developing organization which makes use of the entire teaching personnel of a school.

This book deserves the attention of those concerned with problems of curriculum construction in health and physical education.

CHARLES C. WILSON

Children's Centers—A Guide for Those Who Care for and about Young Children—*Edited by Rose Alschuler. Issued by the National Commission for Young Children. New York: Morrow,* 1942. 168 pp. Price, $1.50.

This is a timely book—replete with valuable data and specific information helpful to those planning, setting up, or supervising any type of unit for young children. The material is well organized and eminently practical. It contains an illustrated equipment list and an excellent bibliography. This small, compact, convenient book covers the most important aspects of the field with wide perspective, understanding, and sound, useful advice.

Children Can Help Themselves—*By Marion Olive Lerrigo. New York: Macmillan,* 1943. 219 pp. Price, $2.25.

This book would be particularly helpful in families where there is an only child, or with the first child in a family. It is written primarily for parents, giving close-up details of the everyday life of a child from the age of one month to eleven years of age.

It gives parents a perspective of how most normal, healthy babies develop. Knowing what to expect of a healthy child at any given age helps to relieve parent anxiety and to keep a balance between our over-cautious and our too careless attitudes.

Written for the layman in simple, narrative form, in chronological style,

it interests only those who are living in a day-by-day relationship with children. The earliest months of infancy are most fully considered, with a far more cursory attitude toward the older child. To find a sensible and casual, yet wise and sympathetic attitude toward a child's habits in relation to the toilet, eating, and sleeping is gratifying.

Your Child, His Family and Friends—*By Frances Bruce Strain. New York: Appleton-Century,* 1943. 210 pp. Price, $2.00.

In dealing with the feeling aspects of a child's development an attempt is made to help the adult to recall the emotional atmosphere of his own childhood and thereby gain the much needed insight into the emotional life of a child. Mrs. Strain stresses the importance of the early developmental years in every child's life, as conditioning his approach to all that he encounters in his later life.

Our Children Face War—*By Anna W. M. Wolf. New York: Houghton Mifflin,* 1942. 214 pp. Price, $2.00.

Mrs. Wolf, well known through her association with the Child Study Association in New York City, writes out of a rich background of experience with parents and with children. Her consideration of the effects of this war on our children gives us pause. She thinks of children sensitively and with vision.

CORNELIA GOLDSMITH

Vitamins and Hormones — *Advances in Research and Application. Vol. I—Edited by Robert S. Harris and Kenneth V. Thimann. New York: Academic Press Inc. Publishers,* 1943. 452 pp. Price, $6.50.

This volume is not divided into chapters but is made up of ten sections, each one dealing with a special subject written by investigators who are recognized authorities in the fields they discuss. Thus the subject of Choline is discussed by Best and Lucas; the appraisal of nutritional states by Jolliffe and Most; physical methods for the identification and assay of vitamins and hormones by Loofbourow; the chemical and physiological relationship between vitamins and amino acids by Mitchell; the photoreceptor function of the Carotenoids and Vitamin A by Wald; the significance of the vitamin content of tissues by Roger Williams; growth factors for protozoa by Hall; physiology of pernicious anemia material by Minot and Strauss; the intermediate metabolism of the sex hormones by Pincus and Pearlman; and the Hormones of the adrenal cortex by Reichstein and Shoppee.

It is the plan of the editors to publish yearly volumes on Vitamins and Hormones which will chronicle progress and point the way to new achievements. This volume, since it is intended primarily as a reference book, contains a very complete subject and author index. It has been the aim of each author to accumulate, correlate, and digest the current literature in the field in which he is interested, to point out where knowledge is incomplete, and to indicate the directions in which future research would be most fruitful.

The reviewer agrees with Dr. McCollum, the author of the Foreword, when he states "The time is ripe for the founding of such a venture, since it is no longer possible for anyone to read sufficient of the current papers and the library files dealing with these two classes of substances to assimilate all the knowledge which has accumulated. We must increasingly depend upon our colleagues, who maintain mastery of specialized experimentation, to appraise for us the numerous contributions which they alone can interpret, sifting error from truth and assembling scattered data to make a connected account which places a body of related facts in proper perspective."

This function of the new publication

is well fulfilled. No research worker who wishes to keep himself properly oriented in his field and no individual who wishes to keep abreast of these specialized subjects can well be without this volume. IRA A. MANVILLE

Air-borne Infections—*By Dwight O'Hara, M.D. New York: Commonwealth Fund,* 1943. 114 pp. Price, $1.50.

In this group of essays Dr. O'Hara reviews the biology of air-borne infections. The central theme is that air-borne infections share a characteristically decreasing death rate which is greater than we can possibly claim as due to our measures for their direct control. With full appreciation of host-parasite relationship, Dr. O'Hara emphasizes the tremendous importance of inapparent infection, and warns that complete elimination of infection will result in a very vulnerable population unless artificial active immunization can be substituted. This broad perspective is achieved by means of excellent clinical discussions of individual respiratory diseases, supported by a minimal number of appropriate charts and tables. The significance of social and environmental factors is brought into focus and the whole is imbued with admirable preventive flavor. Each discussion is authoritative and as up-to-date in its scientific allusions as in its sprightly phraseology. The style is witty and charming, the ideas are provocative. This is a booklet recommended to everyone. Even the price is right! CHARLES EDWARD SMITH

Personal and Community Health —*By C. E. Turner, Sc.D., Dr.P.H. (7th ed.) St. Louis: Mosby,* 1943. 585 pp. Price, $3.50.

This seventh edition of Turner's standard textbook on personal and community health has the virtues of previous editions and the additional value of the author's added experience and suggestions he has received from those who have used the previous editions.

It is divided into two parts, dealing respectively with personal health and with community health. There is an extensive appendix dealing with the control of communicable diseases and another with disinfection. There is a list of prefixes, suffixes, and combining forms, a glossary and an excellent index.

In Part I are 19 chapters dealing with introductory material on hygiene and health, nutrition, digestion, oral hygiene, respiration, circulation, kidneys, skin, endocrines, sense organs, nervous system, mental hygiene, body activity, body mechanics, foot hygiene, reproduction, heredity, narcotics and stimulants, and a summarizing chapter on adult hygiene.

Part II contains 12 chapters on community health, dealing respectively with the science of disease prevention, communicable diseases, essential facts of immunity, three great plagues (tuberculosis, syphilis, and the common cold), food control, water supply, waste disposal, ventilation, heating and lighting, public health administration, maternal and child hygiene, and school and industrial hygiene.

The material is factually sound, conservative, and dependable. It is, in the judgment of this reviewer, more attractively presented than in previous editions. An attractive quality of the presentation is the number, diversity, and quality of the illustrations and the clear typography, especially the generous leading between the lines. Even where small type is used it is readily readable.

This is a book that for accuracy, comprehensiveness and objectiveness may safely be recommended to any teacher or student as a reference work.

The four color plates are a distinct addition to the book.

W. W. BAUER

BOOKS RECEIVED

RACE AND RUMORS OF RACE: CHALLENGE TO AMERICAN CRISIS. By Howard W. Odum. Chapel Hill, N. C.: University of North Carolina Press, 1943. 245 pp. Price, $2.00.

CIVILIZATION AND DISEASE. By Henry E. Sigerist, M.D. Ithaca, N. Y.: Cornell University Press, 1943. 255 pp. Price, $3.75.

THE HOSPITAL IN MODERN SOCIETY. Edited by Arthur C. Bachmeyer, M.D., and Gerhard Hartman, Ph.D. New York: Commonwealth Fund, 1943. 768 pp. Price, $5.00.

MEDICAL PARASITOLOGY AND ZOÖLOGY. By Ralph Welty Nauss, B.Sc., M.D., Dr.P.H. Foreword by John C. Torrey, Ph.D. New York: Hoeber, 1944. 534 pp. Price, $6.00.

NASCENT ENDOCRINE THERAPY. By John Franklin Ritter, M.D. Caldwell, Idaho: Caxton Printers. 317 pp. Price, $5.00.

PATHOLOGY AND THERAPY OF RHEUMATIC FEVER. By Leopold Lichtwitz, M.D. Edited by Major William Chester, M.C. Foreword by William J. Maloney, M.D. New York: Grune & Stratton, 1944. 211 pp. Price, $4.75.

STATISTICAL ABSTRACT OF THE UNITED STATES, 1942. 64th Number. Compiled under the supervision of Morris H. Hansen. Washington: Bureau of the Census, U. S. Department of Commerce, 1943. 1097 pp. Price, $1.75.

THE ORGANIZATION OF PERMANENT NATION-WIDE ANTI-AEDES AEGYPTI MEASURES IN BRAZIL. By Fred L. Soper, D. Bruce Wilson, Servulo Lima, and Waldemar Sá Antunes. New York: Rockefeller Foundation, 1943. 137 pp. Limited distribution.

HUMAN CONSERVATION: THE STORY OF OUR WASTED RESOURCES. By Lawrence K. Frank, with Louise K. Kiser. National Resources Planning Board. Washington: Superintendent of Documents, U. S. Government Printing Office, March, 1943. 126 pp. Price, $.20.

NURSES HANDBOOK OF OBSTETRICS. By Louise Zabriskie, R.N., and Nicholson J. Eastman, M.D. New 7th Ed. Philadelphia: Lippincott, 1943. 714 pp. Price, $3.25.

TO LIVE IN HEALTH. By R. Will Burnett. New York: Silver Burdett, 1944. 332 pp. Price, $1.96.

HEALTH EDUCATION ON THE INDUSTRIAL FRONT. By The 1942 Health Education Conference of The New York Academy of Medicine. New York: Columbia University Press, 1943. 63 pp. Price, $1.25.

EXPECTANTLY YOURS: A BOOK FOR EXPECTANT MOTHERS AND PROSPECTIVE FATHERS. By Mario A. Castallo, M.D., and Audrey Walz. New York: Macmillan, 1943. 110 pp. Price, $1.75.

THE YOUNGEST OF THE FAMILY—HIS CARE AND TRAINING: A MANUAL FOR THE INEXPERIENCED MOTHER. By Joseph Garland, M.D. Rev. Ed. Cambridge, Mass.: Harvard University Press, 1943. 182 pp. Price, $2.00.

FEEDING BABIES AND THEIR FAMILIES. By Helen Monsch and Marguerite K. Harper. New York: Wiley, 1943. 386 pp. Price, $3.50.

WORKING TOGETHER FOR HEALTH. Health-Happiness-Success Series, Grade 8. By William E. Burkard, Ph.D., Raymond L. Chambers, Ph.D., and Frederick W. Maroney, M.D. New York: Lyons & Carnahan, 1943. 373 pp. Price, $.75.

A TECHNICAL MANUAL FOR THE RESCUE SERVICE. OCD Publication 2216. By U. S. Office of Civilian Defense. Washington: U. S. Government Printing Office, 1943. 142 pp. Price, $.20.

THE PROBLEM OF CHANGING FOOD HABITS. Report of the Committee on Food Habits, 1941–1943. Bulletin No. 108. Washington: National Research Council, National Academy of Sciences, 1943. 177 pp.

RULES AND REGULATIONS OF THE IOWA STATE DEPARTMENT OF HEALTH—Relating to Communicable and Other Reportable Diseases. State of Iowa, in Coöperation with the American Public Health Association and the U. S. Public Health Service. Des Moines: State of Iowa, 1943. 104 pp.

TRANSACTIONS OF THE FIFTH ANNUAL MEETING OF THE NATIONAL CONFERENCE OF GOVERNMENTAL INDUSTRIAL HYGIENISTS. Washington. D. C., April 9–10, 1942. Joint Meeting with the Subcommittee on Industrial Health and Medicine, Health and Medical Committee, Federal Security Agency. Washington: U. S. Public Health Service, 1943. 176 pp.

TRANSACTIONS OF THE SIXTH ANNUAL MEETING OF THE NATIONAL CONFERENCE OF GOVERNMENTAL INDUSTRIAL HYGIENISTS, Rochester, N. Y., May 24, 1943. Washington: U. S. Public Health Service, 1943.

FIRST-AID TRAINING: A STUDY AND PRACTICE BOOK. By Morris Fishbein, M.D., and Leslie W. Irwin, Ph.D. New York: Lyons & Carnahan, 1943. 216 pp. Price, $.80.

EDUCATORS INDEX OF FREE MATERIALS. By John Guy Fowlkes. Randolph, Wisc.: Educators Progress League, 1943. 165 pp.

A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

RAYMOND S. PATTERSON, PH.D.

Public Health in England—After four years of war the health of the English has not only not deteriorated but in some respects has improved, reports the Ministry of Health: 1942 was a year of record breaking statistics with lowest maternal and infant mortality rates, and standardized civilian death rates. Surveys were made which indicated that people were trying to keep fit. On the other hand, the incidence of lousiness is high, many people still sleep in their daytime underwear or in unventilated rooms and old wives tales still are believed. Health education is stressed but more needs to be done.

Anon. On the State of the Public Health. J. Roy. Inst. Pub. Health & Hyg. 6, 11:287 (Nov.), 1943.

Sanitary Code—Third edition of the Sanitation Code intended for state and local adoption.

ANON. Emergency Minimum Sanitation Standards. Pub. Health Rep. 58, 50:1795 (Dec. 10), 1943.

"Shipyard Eye" a Misnomer—If you have shared the popular opinion that epidemic keratoconjunctivitis is a brand new disease this article will disabuse your mind. Also it was not epidemic in Gulf or Atlantic Coast shipyards. To infer that the outbreak spread from Hawaii across the continental United States is not warranted by the facts. Seems as though you had better read the article whatever your beliefs may have been.

BEDELL, A. J. Distribution of Epidemic Keratoconjunctivitis in the United States. J.A.M.A. 123, 17:1107 (Dec. 25), 1943.

"Treated Colds Showed No Striking Difference"—As a result of this study, conclude three men whose opinions all will respect, we are opposed to the routine use of sulfonamides in the treatment of the common cold.

CECIL, R. L., *et al.* Sulfadiazine in the Treatment of the Common Cold. J.A.M.A. 124, 1:8 (Jan. 1), 1944.

Good for American Heads, Too—Rural public health nurses may be interested in this formula which was used in a big way on lousy heads in Mexico. A doctor in New York found it just as efficacious in that city. The formula includes phenyl cellosolve, ethanol, and methyl salicylate.

DAVIS, W. A. A Treatment for Pediculosis Capitis. J.A.M.A. 123, 13:825 (Nov. 27), 1943.

Smallpox a la mode—Where vaccination is required, there smallpox incidence is lowest. None of us expects that this fact will have any influence upon the alleged reasoning of the rabid antivaccinationist, but it is a useful statistic to have tucked away none the less.

HAMPTON, B. C. Smallpox in Relation to State Vaccination Laws and Regulations. Pub. Health Rep. 58, 49:1771 (Dec. 3), 1943.

Community Studies of Tuberculous Selectees—In this study of inductees infected with tuberculosis there is found evidence that socio-economic level and nationality are secondary to population density as factors influencing the rate. There is need for further investigation along these lines say the authors of this excellent research.

HYDE, R. W., and ZACKS, D. Socio-economic Aspects of Disease. New England J. Med. 229, 22:811 (Nov. 25), 1943.

Pep, Kick, Crackels, *et al.*—As an aid to health workers interested in the

nutritive values of prepared cereal foods, the Council on Foods and Nutrition has obtained factual information about the amounts of thiamine, riboflavin, and niacin in readily obtainable products. Table tells all.

KITZES, G., and ELVEHJEM, C. A. Vitamin Content of Prepared Cereal Foods. J.A.M.A. 123, 14:902 (Dec. 4), 1943.

Into the Mouths of Babes—Two quadrants of the teeth of a group of children were treated with 7–15 topical applications of sodium fluoride. Dental examinations were made before and a year after on these and a control group of children. Approximately 40 per cent less new carious teeth occurred in the treated than the untreated portions of the mouths, the reduction being greater in the upper than the lower quadrants. Teeth previously attacked by caries were not influenced by the treatment. In the untreated quadrants the incidence of caries was the same as in the mouths of the control group.

KNUTSON, J. W., and ARMSTRONG, W. D. The Effect of Topically Applied Sodium Fluoride on Dental Caries Experience. Pub. Health Rep. 58, 47:1701 (Nov. 19), 1943.

Better Late Than Never—Experience at the Guggenheim Dental Clinic gives evidence that sound habits instilled at baby clinics give but transient results, for the baby's routine is soon made to fit the family activities bringing on increasing irregularities in meals, sleep, essential foods, and general daily care. Only a few children have the minimum allotment of milk. School dental services are the logical solution to the problems created by this condition, concludes the writer.

KRASNOW, FRANCES, PH.D. Dental Caries: A Serious Health Problem. J. School Health. 13:239 (Dec.), 1943.

Apropos "Are Council and Board Members People?" *—A lot of unpleasant data are presented which reveal no basis for supposing that important creative work is being done today by individuals who are older than like contributors of past centuries have been. Indeed, the change seems more in favor of our present crop of younger smart-alecks than in the direction of us stalwarts—with our hardened arteries. Yes, the findings hold for medicine and public hygiene as well as literature and philosophy. Humpf! say we.

LEHMAN, H. C., Man's Most Creative Years: Then and Now. Science. 98, 2549: 393 (Nov. 5), 1943.

* Editorial A.J.P.H. 33, 9:1126 (Sept.), 1943.

Lo! The Poor Indian—An isolated colony of Indians living along the path of the Alaska Highway had, in succession, tribe-wide epidemics of measles, dysentery, jaundice, German measles, whooping cough, and meningitis. None of these outbreaks returned to plague the white population from which it sprang.

MARCHAND, J. F. Tribal Epidemics in the Yukon. J.A.M.A. 123, 16:1019 (Dec. 18), 1943.

Measles Prophylaxis—Measles virus cultivated upon chick embryo produced measles of a mild character in 80 per cent of known susceptible children. There is evidence that the mild disease affords some protection against natural infection.

RAKE, G. Experimental Investigation of Measles. J. Pediat. 23, 4:376 (Oct.), 1943.

ASSOCIATION NEWS

APPLICANTS FOR MEMBERSHIP

The following individuals have applied for membership in the Association. They have requested affiliation with the sections indicated.

Health Officers Section

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Arthur B. Stiles, 370 Main St., Owego, N. Y., President, Tioga County General Hospital

DECEASED MEMBERS

Alice Ahern, R.N., Ottawa, Ont., Can., Elected Member 1928, Public Health Nursing Section

James V. Foley, M.D., M.P.H., Pocatello, Ida., Elected Member 1941, Health Officers Section

Mrs. Mary S. Hull, R.N., Santa Fe., N. M., Elected Member 1940, Public Health Nursing Section

J. H. Kellogg, M.D., Battle Creek, Mich., Elected Member 1878, Food and Nutrition Section

Paul Molitor, Chatham, N. J., Elected Member 1932, Engineering Section

C. B. Ransone, M.D., Roanoke, Va., Elected Member 1924, Health Officers Section

EMPLOYMENT SERVICE

The Association Employment Service seeks to bring to the attention of appointing officers the names of qualified public health personnel and to act as a clearinghouse on employment. This is a service of the Association conducted without expense to the employer or employee.

From the registry of persons available, selected announcements are published from time to time. Appointing officers may obtain lists of all registrants on request.

Address all correspondence to the Employment Service, American Public Health Association, 1790 Broadway, New York 19, N. Y.

POSITIONS AVAILABLE

Wanted: A physician trained in tuberculosis to assume administrative control of the Bureau of Tuberculosis in an eastern city of 200,000 population. Salary $3,900–$4,500 plus cost of living adjustment. Address Box B, Employment Service, A.P.H.A.

Sanitarian wanted: Preferably with Bachelor's degree or engineering degree, plus public health experience or training. Must have own car. Applicant with lower qualifications will be offered an opportunity to take a short, free indoctrination course. Salary $1,920 per year with travel allowance of $50 per month, if qualified. Apply Dist. Dept. of Health, No. 6, Central Office, Newberry, Mich., Dr. Franklin.

Wanted: Pediatrician to supervise medical care of children at cerebral palsy center being established by private institution in coöperation with Illinois Division of Services for Crippled Children. Salary commensurate with experience and training. For further information write Lawrence J. Linck, Director, Division of Services for Crippled Children, 1105 So. Sixth St., Springfield, Ill.

The Department of Health, New Jersey, whose industrial health activities have expanded rapidly during the present war, has announced its need for two full-time industrial hygiene physicians for its Industrial Hygiene Service. As one of the leading states in the production of war materials, New Jersey offers unusual opportunities for gaining experience in occupational disease control besides giving the physician a chance to make a valuable contribution to the war effort. The principal duties of the selected physicians will be consultations in regard to the following: control of occupational diseases; industrial toxicological problems; evaluation of adequacy of plant medical services; promotion of measures which will reduce absenteeism from non-occupational causes; and conduct of industrial health education activities. Physicians interested in these positions should write to the Department of Health, Trenton, N. J.

Merit System for Personnel Administration in Delaware will set examinations for 3 positions in the Delaware State Board of Health shortly. The positions open for examination, together with the beginning salaries, are: Deputy State (County) Health Officer ($3,800), Pediatrician ($3,600), and Medical Social Consultant ($2,400).

These examinations will be unassem-

bled, but successful candidates will be expected to appear in Delaware for an oral interview which will be a weighted part of the examination. Appointments may be expected soon after the examinations are conducted.

Information and specifications as prepared for each position may be secured by communication with the Merit System Supervisor, P. O. Box 1911, Wilmington, Del., and application for examination must be made on the official form.

The Milwaukee Health Department is interested in obtaining an instructor in hospital nursing to conduct a student educational program in its communicable disease hospital. Salary offered begins at $125 per month with maintenance, and increases of $5 per month each year until $135 has been reached. To this basic salary there has been added a cost of living bonus of $30.64 per month, making the total beginning salary $155.64 plus maintenance. Apply to Dr. G. F. Burgardt, Deputy Commissioner of Health, Milwaukee, Wis.

Wanted: Public health physicians in Texas. George W. Cox, M.D., State Health Officer, Austin, Tex.

Hawaiian Territorial Board of Health seeks trained engineer to supervise rodent plague control program. Salary range from $331.67 to $398.33 per month subject to retirement deductions plus bonus. Position under Territorial civil service system with classification of P-4. For further details address A.P.H.A. Employment Service.

Wanted: Physical therapist by crippled Children's Division. Should be graduate of a school of nursing or of college, with a major in physical education or science; have completed a course in physical therapy; should have had experience in physical therapy, preferably with children. Write for application blank to Merit System Council, 416 Henry Building, 309 S.W. 4th Ave., Portland 4, Oregon.

Psychiatric case worker desired for mental hygiene clinic, Department of Health, Peoria, Ill.

Senior Sanitarian, Alaska Health Department. Minimum requirements 2 years college, 6 months public health course, 2 years' experience. Two additional years' experience acceptable instead of each year college. Monthly salary $235–$265. Mary B. Pool, Alaska Merit System, Juneau.

Michigan announces civil service positions now open for orthopedic public health nurse, Grades II and III classes with the Michigan Crippled Children's Commission. Salary range: Grade II $230 to $270 per month; Grade III $280 to $340 per month. Grade II not under 23, Grade III not under 25. Must have completed course in orthopedic nursing or physical therapy in approved school. For Grade III position a full-time course of at least 9 months' duration is required. Must have 3 years' experience in public health nursing, one year of which shall have been in supervisory capacity. For Grade III position one additional year of nursing and one additional year of supervisory experience required. Eligibility for certificate in public health nursing and registration as a nurse in Michigan. For further information write Michigan Civil Service Commission, 310 No. Grand Ave., Lansing 4, Mich.

Wanted: Sanitary engineer or chemist to assist in stream pollution survey and later in study of sewage treatment. Should be qualified to perform chemical and bacteriological analyses of water and sewage and chemical analyses of industrial wastes. Nine months employment beginning as near January 1 as possible, with possibility of indefinite continuation, particularly if person is willing to do some other types of analytical work, including coal analysis. Salary $175–$250 per month depending on qualifications. Women considered. Address communications to Prof. Gilbert H. Dunstan, Dept. of Sanitary and Public Health Engineering, University of Alabama, Box 1996, University, Ala.

Industrial Hygiene Toxicologist. Calls for person of chemical or chemical engineering background. Position, supervising of chemical work of industrial hygiene service and industrial hygiene laboratory; designing special apparatus for field studies on occupational disease problems; conducting field and laboratory analyses of toxicological exposures in industry; keeping records, interpreting results and preparing records. Requirements, knowledge of chemical laboratory methods and equipment; procedures for qualitative and quantitative analysis of organic and inorganic chemistry; knowledge of chemical methods of determining toxic materials in industry; familiarity with petrographic methods of mineralogical analysis. Immediate temporary appointment will be made, to be followed later by civil service examination to determine permanent status. Salary $2,900 base, plus $100 a year war adjustment, or total of $3,000 per year. Travel expenses also allowed. Must be U. S. citizen. Resident of any state may

apply. Write J. Lynn Mahaffey, M.D., Director of Health, State Department of Health, Trenton 7, N. J.

Wanted: Senior assistant serologists for immediate employment in New Mexico Public Health Laboratory, Albuquerque. Bachelor of Science degree and 1 year experience as serologic assistant in laboratory of recognized standing required. Starting salary $145 per month. Women or draft exempt men preferred. Address Dept. of Public Health, Box 711, Santa Fe, N. M.

Wanted: Public Health Nurse. Salary $175 per month and full maintenance, plus $25 per month for car expense. Must furnish own car. Write Paul D. Crimm, M.D., Director Boehne Tuberculosis Hospital, Evansville 12, Ind.

City of 70,000, southeastern U. S., seeks qualified health commissioner between the ages of 30 and 45, draft exempt. Salary $4,500 plus auto allowance of $300 per year. Box V, Employment Service, A.P.H.A.

Assistant Sanitarian in well established Ohio department of health. Minimum experience 2 years required. Merit system prevails. Salary $1,800-$2,400. Write Box K, Employment Service, A.P.H.A.

Wanted: Bacteriologist to conduct virus laboratory in the Laboratory Section of the Health Division, City of St. Louis. Applicant must have graduate degree with research and practical experience in virology. Salary range from $220 to $360 a month, depending upon ability. Position under Civil Service. Write Box W, Employment Service, A.P.H.A.

Wanted: Statistical clerk, preferably with college degree and experience in health education, to study and analyze vital statistics in suburban and rural county adjacent to Washington. Special emphasis on relation to health department services and participation in Health Honor Roll. Address V. L. Ellicott, M.D., Dr.P.H., Montgomery Co., Rockville, Md.

Wanted: Medical Social Worker for Dept. of Health, Peoria, Ill. Address Director Maternal and Child Health, Dept. of Health, Peoria, Ill.

Wanted: Phyisician in eastern city of 200,000 population as Director of Bureau of Maternal and Child Hygiene. Address Box C, Employment Service, A.P.H.A.

Wanted: Physician (male), American citizen, draft exempt, trained in pediatrics, for a 3 year position as chief resident and research assistant in fine pediatric tuberculosis hospital, New York. Good Salary and maintenance. Only one intensely interested in research need apply. Send full details of qualifications and photograph. Box R, Employment Service, A.P.H.A.

FOR OTHER POSITIONS AVAILABLE WRITE EMPLOYMENT SERVICE, AMERICAN PUBLIC HEALTH ASSOCIATION, 1790 BROADWAY, NEW YORK 19, N. Y.

In view of the current active demand for trained and experienced persons in public health, it is suggested that prospective employers communicate directly with the Employment Service, American Public Health Association, 1790 Broadway, New York 19, N. Y., for up-to-date lists of applicants.

POSITIONS WANTED

Administrative

Physician, age 37, M.D. Iowa, Dr.P.H. Harvard, specializing in tuberculosis, seeks position as medical director of a sanatorium or a state bureau of tuberculosis. Exempt from military service. A-476

Physician, M.D. University of Arkansas, M.P.H. Harvard, experienced as county health officer. Age 35. Will consider position as county or city health officer or director of a bureau. A-506

Physician, M.D. Yale, with private practice industrial medicine. Age 39 and draft exempt. Seeks opportunity as public health physician. A-505

Woman physician, age 35, M.D. University of Minnesota, 2 years' experience as county health officer, seeks clinical or administrative position, preferably South. A-510

Woman physician, experienced in pub-

lic health education and school health service administration and supervision, seeks full- or part-time position, preferably southeastern New York State. A-511

HEALTH EDUCATION

Woman with background of health education and public health nursing, experienced as teacher, supervisor, and writer, seeks teaching position of responsibility. H-507

Health educator with Master's degree in public health and some experience. Prefers position in official agency. H-510

LABORATORY

Research bacteriologist. Unusually trained and experienced woman bacteriologist and serologist now occupying responsible position in state laboratory seeks research work of permanent character. L-468

Water chemist, bacteriologist, M.S. degree in Sanitary Chemistry. Age 36, draft exempt. Eight years' experience in state laboratory working on water, milk and sewage. Prefers Midwest or Pacific Northwest location. L-469

MISCELLANEOUS

Public Health Nurse. B.S. in nursing, William and Mary College, age 53, seeks position as coördinator of public health nursing, educational director, or director student nurse public health program. Prefers Middle Atlantic States. M-452

Advertisements

Wanted: Biochemist with a creative mind for independent research. Preference is for a man with experience in drugs and antiseptics. Large company in New Jersey will pay well for qualified person. Salary from $5,000. Everett Brown Agency, 17 John Street, New York, N. Y.

Opportunities Available

WANTED—(a) Public health physician for important administrative appointment; preferably someone academically and research-minded; vicinity New York City. (b) Public health physician to direct department of maternal and child health; central metropolis; immediately. (c) Epidemiologist; venereal disease program; appointment offering university affiliation; South. (d) Student health physician qualified to serve also as professor of biology, small college; South. (e) Physician experienced in urology or venereal diseases; Chicago. (f) Student health physician; young women's college; census of about 2,000; staff comprised of nine nurses; five physicians; East; June. PH-1, Medical Bureau (Burneice Larson, Director), Palmolive Building, Chicago.

WANTED—(a) Supervisor of public health nursing; administrative ability required; must be interested in developing active program of public health education as well as strengthening public health nursing and clinic services already inaugurated; South. (b) Assistant director, visiting nurses' association; staff of 60 nurses exclusive of affiliate students; B.S. degree required; public health nursing experience desirable; East. (c) Teacher-nurses for high school and, also, nurse for elementary school; former positions require baccalaureate degrees with graduate training in public health nursing; elementary school position requires degree but not necessarily public health training; town of 65,000, Middle West. (d) Public health nurse to join staff of tuberculosis association; duties consist of demonstrations in schools, staff conferences with teachers, advising and consulting with teachers and parents and with school nurse; East. (e) Industrial nurse; recent graduate preferred; medical department of military organization; Middle West. (f) School nurse; boys' military preparatory school; student body of 200 cadets; duties include charge of infirmary and general health of school; South. (g) Public health nurse to organize and supervise industrial nursing department, plant averaging 700 employees; at present department is small but new department being built which will include all facilities; permanent; minimum, $200; Middle West. (h) College nurse; young women's college; 300 students; Middle West. PH1-2, Medical Bureau (Burneice Larson, Director), Palmolive Building, Chicago.

WANTED—(a) Bacteriologists for dairy laboratories of state university; B.A. degree and advanced training in bacteriology required; salary dependent on qualifications. (b) Serologist; state department of health averaging 5,000 blood tests weekly; Middle West. (c) Bacteriologist; public health and clinical laboratories of county hospital; $2,200; Michigan. (d) Histology technicians department of laboratories, city department of health; well staffed department; vicinity New York City. PH1-3, Medical Bureau (Burneice Larson, Director), Palmolive Building, Chicago.

Situations Wanted

PUBLIC HEALTH NURSE—is available for executive position, B.S. degree Columbia; three years, supervising nurse, state department of health; five years, field supervisor, large industrial company; four years, educational director, public health department, college of nursing. PH1-4, Medical Bureau (Burneice Larson, Director), Palmolive Building, Chicago.

PHYSICIAN distinguished in field of public health medicine is available; B.S., M.S., M.D., D.P.H. degrees, leading schools; enviable career of successful experience in academic and administrative public health work; recognized as able leader. PH1-5, Medical Bureau (Burneice Larson, Director), Palmolive Building, Chicago.

NEWS FROM THE FIELD

HEALTH ADVISORY COUNCIL, U. S. CHAMBER OF COMMERCE

The Chamber of Commerce of the United States has announced the appointment of Dr. Leverett D. Bristol, Executive Director of the Hospital Council of Greater New York, as Chairman of the Chamber's Health Advisory Council and Dr. A. J. Lanza, Chief of the Occupational Hygiene Section of the Office of the Surgeon General, U. S. Army, as Chairman of the Council's Committee on Industrial Health. The Advisory Council, it will be recalled, was created recently to assist the Chamber's Insurance Department in advising business organizations throughout the country on industrial, individual, and community health programs and to coöperate with national, state, and local health agencies.

RECURRENCE OF KERATOCONJUNCTIVITIS IN DETROIT

Dr. Bruce H. Douglas, Health Commissioner of Detroit, announced on January 10 that there is evidence of a recurrence of the highly communicable eye infection, keratoconjunctivitis, first seen in Detroit last winter. During 1943, 252 cases were reported and 21 have been reported so far this year. Dr. Douglas warns eye specialists and industrial physicians who were concerned in holding the disease in check to be on their guard again.

TEXAS STATE HEALTH DEPARTMENT MOVES TO NEW QUARTERS

News has been received of the completion of the new State Health Department building at 400 East 5th Street, Austin, Tex., into which the department has now moved. Dr. George Washington Cox is State Health Officer.

According to the *Texas Journal of Public Health*, the new center for public health activities in the state has been made possible by federal and state funds. The building incorporates the former state laboratory building as one wing. Construction throughout is reinforced concrete. All health department functions will now be assembled in this building, which is said to be particularly adequate so far as lighting and ventilation are concerned.

DR. GODFREY REAPPOINTED NEW YORK STATE COMMISSIONER OF HEALTH

Late in December, Governor Thomas E. Dewey of New York State announced the completion of his official cabinet with the appointment as Commissioner of Health of Edward S. Godfrey, Jr., M.D., who has served in this capacity by appointment of former Governor Lehman since 1936. Since January 1, 1943, Dr. Godfrey has served in a hold-over capacity.

Dr. Godfrey has served with the New York State Department of Health since 1917. For many years he was epidemiologist and later director of the Division of Communicable Diseases. He subsequently became director of Local Health Administration and then Commissioner. Dr. Godfrey was President of the American Public Health Association 1939–1940.

MICHIGAN OFFERS IN-SERVICE TRAINING COURSE IN MILK SANITATION

An in-service training course for milk sanitarians has been announced by the School of Public Health, University of Michigan, Ann Arbor, for March 6

to 10. According to H. E. Miller, resident lecturer in public health engineering, this course is designed to serve a limited number of key milk control officials in Michigan, Ohio, Indiana, and Illinois. According to Mr. Miller, the purpose of the program is to train individuals as a reservoir from which to obtain teachers for instruction in milk sanitation on the state or local level. Provision has been made for a registration of 60 persons. Beside the staff of the University of Michigan participating in the program, there will be, among others, Professor W. L. Mallmann of Michigan State College; Dr. C. S. Bryan, Michigan State College; Professor I. D. Mayer of Purdue University; Russell Palmer of the Detroit Department of Health; Dr. Warren P. Hall of the Toledo Health Department; John M. Hepler of the Michigan State Health Department; L. F. Warrick of the Wisconsin State Health Department; L. Glen Shields of the Detroit Department of Buildings and Safety Engineering; John Andrews, U. S. Public Health Service, Washington; William J. Guerin, City Health Department, Chicago; and Dr. W. H. Haskell of the U. S. Public Health Service, Chicago.

NEW YORK STATE BEGINS FREE DISTRIBUTION OF TETANUS TOXOID

The New York State Department of Health, Albany, has announced that a limited supply of tetanus toxoid (unprecipitated) which has been prepared and tested by the Division of Laboratories and Research is available for distribution to physicians for active immunization against tetanus. Application for supplies is to be made to the Central Laboratory in Albany. According to the department, the general use of tetanus toxoid is not indicated. However, the active immunization of children and of farm laborers and workers in certain industries who are subject to repeated injuries may be of definite value. According to the announcement, it is expected that later a combined precipitated diphtheria and tetanus toxoid will be distributed. The preparation is distributed in 10 ml. vials, 3 injections of 1 ml. at 21 day intervals being recommended. A stimulating dose of 1 ml. of tetanus toxoid is recommended at the end of a year and a stimulating dose of toxoid at the time of an injury is said to be considered by the U. S. Army as sufficient to protect against tetanus infection.

PERSONALS

Central States

CHARLES F. ATKINSON, M.D., of Indian River, Mich., has been appointed Medical Director of District No. 1 of the State Health Department, located at Lake City.

L. T. COGGESHALL, M.D.,† who has been Chairman of the Department of Tropical Diseases in the School of Public Health, University of Michigan, Ann Arbor, has resigned to become the Medical Director of a Marine Rehabilitation Unit of the U. S. Navy for patients with tropical diseases and with special concern for the investigation of the problem of relapse in malaria. Dr. Coggeshall will direct a large hospital set-up for this Unit on the West Coast.

GEORGE B. DARLING, DR.P.H.,* President and Comptroller of the W. K. Kellogg Foundation, Battle Creek, Mich., has resigned to become associated with the Division of Medical Science of the National Research Council.

THOMAS S. DAVIES, M.D., has been

* Fellow A.P.H.A.
† Member A.P.H.A.

named Health Commissioner of the Grosse Pointe (Mich.) townships, succeeding BENJAMIN H. WARREN, M.D.,† resigned.

BERTIS C. GWALTNEY, M.D., of Fort Branch, Ind., Health Officer of Gibson County, has been appointed assistant collaborating Epidemiologist of Indiana.

ALBERT F. LITZENBURGER, M.D., of Boyne City, Mich., has been appointed Director of District Health Unit No. 3, with headquarters in Charlevoix and serving Charlevoix, Emmet, Antrim, and Otsego Counties.

RAYMOND J. L. NORFRAY, M.D., of Chicago, Ill., has been appointed Assistant to WILLIAM H. HAINES, M.D., Chicago, Director of the Cook County Behavior Clinic.

ELVIN L. SEDERLIN, M.D.,† former Fargo City Health Officer and lately District Health Officer of Valley City, N. D., has been transferred to Bismarck. This results from the fact that the Valley City District Health Office has been discontinued.

FRED O. TONNEY, M.D.,* formerly Director of Laboratories and Research of the Chicago, Ill., Board of Health—recently Health Director and Research Consultant to the Toledo Scale Company, Toledo, Ohio, under a research grant from the company to the Toledo Health Department—has been named Health Officer of District No. 2, comprising Lake, McHenry, and Boone Counties, with headquarters in Woodstock, Ill.

JAMES WATSON, M.D., Director of the Division of Mental Hygiene, North Carolina State Board of Charities and Public Welfare, Raleigh, has been appointed Chief Medical Officer in the Illinois State Department of Public Welfare, to succeed CONRAD S. SOMMER, M.D., who recently became Deputy Director of the Mental Hygiene Service in the Department of Public Welfare.

Eastern States

JOSEPHINE J. ALBRECHT † has resigned from the staff of the Boston Health League, Boston, Mass., to become Executive Secretary of the Health Division of the Community Welfare Council of Omaha, Neb.

COL. GEORGE BAEHR,* Chief Medical Officer, U. S. Office of Civilian Defense, Washington, D. C., and a member of the Public Health Council of the State of New York, has been elected a member of the board of managers of the State Charities Aid Association, New York, N. Y.

DR. THOMAS D. DUBLIN, M.D., DR.P.H.* has been promoted to become Professor of Preventive Medicine and Community Health in the Long Island College of Medicine faculty, it has been announced by Dr. J. A. Curran, President of the Long Island College of Medicine.

L. WHITTINGTON GORHAM, M.D., of Albany, N. Y., has been reappointed to the New York State Public Health Council for a period of six years by Governor Thomas E. Dewey.

JAMES M. MACINTOSH, M.D., Professor of Public Health at the University of Glasgow, Scotland, and formerly Chief Medical Officer of the Department of Health of Scotland, came to the United States in September as guest of the Commonwealth Fund, New York, N. Y. Dr. Macintosh was the leader in organizing the Provisional National Council for Mental Health in Great Britain and is in this country, according to the *News Letter* of the Commonwealth Fund, to study at first hand small community hospital and rural public health services. He has spoken before many medical and public health groups. He completed his study in December and is returning to Scotland.

* Fellow A.P.H.A.
† Member A.P.H.A.

IDA MCROBERTS, R.N.,† has been appointed Public Health Nursing Director in the Cattaraugus County Department of Health, Olean, N. Y., where she has served as Nursing Supervisor. She succeeds MARION I. MURPHY, R.N.,† who has been appointed to the Michigan State Department of Health, Lansing.

J. LOUIS NEFF,* Executive Secretary of the Nassau County Medical Society, Mineola, N. Y., has been appointed Executive Director of the American Society for the Control of Cancer, New York, N. Y., effective January 1.

EDITH H. SMITH, Dean of the School of Nursing, Syracuse University, Syracuse, N. Y., has been appointed Chairman of the Committee on Recruitment of Student Nurses of the National Nursing Council. She succeeds KATHARINE FAVILLE, R.N.,* who has served as Chairman since October, 1941, and under whose guidance recruitment by state and local councils as well as national agencies was inaugurated and has resulted in steadily increasing admissions.

GERTRUDE FOLKS ZIMAND has been appointed General Secretary of the National Child Labor Committee, New York, N. Y., succeeding the late COURTENAY DINWIDDIE.* Mrs. Zimand has been identified with the committee at various times since 1916, and since 1935 has been its Associate General Secretary.

Southern States

JESSE P. CHAPMAN, M.D., of Selma, Ala., has been reappointed Chairman of the Women's Field Army of the American Society for the Control of Cancer.

JAMES E. COLEMAN, M.D., of Fayetteville, W. Va., has been appointed by the public Health Council as full-time Health Officer of Fayette County.

WILLIAM B. GRAYSON, M.D.,* of Little Rock, Ark., State Health Officer since 1933, has resigned, effective November 15. THOMAS T. ROSS, M.D., M.P.H.,† of Little Rock, State Director of the Bureau of Local Health Service, has been appointed Acting Head, it was announced.

MABEL M. E. HART, M.D., has resigned as Director of Health for the Tulsa Public School System, Tulsa, Okla., after 12 years' service in the position.

GEORGE JAMES, M.D.,† the Director of the Obion-Lake Health District, Union City, Tenn., has resigned to accept a training position with the New York State Health Department, Albany.

PHILIP G. JOSEPH, M.D., of Oklahoma City, Okla., has been named Director of the Creek County Health Unit, succeeding LELAND F. SHRYOCK, M.D., of Oklahoma City.

ROY H. MCDOWELL, M.D., has resigned as Clinic Supervisor of the Durham Health Department, Durham, N. C., to return to private practice.

FRANK M. MELTON, M.D., of La Grange, Ky., has been named Director of the Madison County Health Department, succeeding MAX E. BLUE, M.D.,† of Richmond.

WILLA L. MURRAY, M.A., has resigned from the George Washington University School of Medicine, Washington, D. C., to accept a position with the Health Department of the Territory of Hawaii in the Division of Nervous and Mental Diseases.

GEORGE E. NEWTON, M.D., has resigned as Health Officer of Autauga and Chilton Counties, to practice in Prattville, Ala.

PHILIP S. OWEN, M.D., technical aid to the Sub-committee on Medical

* Fellow A.P.H.A.
† Member A.P.H.A.

Food Requirements, Advisory to the Office of Price Administration, Washington, D. C., has been named technical aid to the Division of Medical Sciences, National Research Council, Washington, to succeed GEORGE K. ANDERSON, M.D., now Secretary of the Council on Foods and Nutrition of the American Medical Association.

GEORGE A. SHIPMAN, M.D.,† of Atlanta, Ga., Industrial Hygiene Physician of the Georgia Department of Public Health, has been appointed Director of the Bureau of Industrial Hygiene of the Alabama Department of Public Health. EDWIN H. PLACE, M.D.,† of Montgomery, Ala., Director of the Alabama unit, will take over the activities of Dr. Shipman in the Georgia Department.

LOWELL L. STOKES, M.D.,† of Okmulgee, Okla., U. S. Public Health Service, has been named in charge of the Lauderdale County Health Unit. The position has been vacant since JULIUS E. DUNN, M.D., of Anniston, resigned early in 1943 to become Health Officer of Etowah and Calhoun Counties.

HENRY G. WALDROP, M.D., of Ripley, Miss., has been appointed Health Officer of Clarke and Wayne Counties, effective September 1.

JESSE W. WILLCOX, M.D., of Wilmington, N. C., has been appointed Health Officer of Moore County, succeeding BENJAMIN M. DRAKE, M.D.,† of Carthage, who resigned to accept a similar position in Alamance County.

Western States

FRANK E. GALLISON, M.D., M.P.H.,† of Ventura, Calif., has resigned as Health Officer of Ventura County.

EDWIN B. GODFREY, M.D.,† of El Centro, Calif., has resigned as Health Officer of Imperial County.

FRED W. HARB, M.D., of the U. S. Public Health Service, has been assigned as Medical Director of the new Treatment Center for women with venereal diseases, in Seattle, Wash. The Florence Crittenton Home will be the headquarters for the Center.

SAMUEL J. MCCLENDON, M.D., of San Diego, Calif., has been appointed a member of the California State Department of Public Health, to succeed FRANCIS M. POTTENGER, SR., M.D.,† of Monrovia, whose term expired.

Mexico

MANUEL GONZALEZ RIVERA, M.D., has been appointed Chief of the Division of Health Education in the new Ministry of Public Health and Wel-

* Fellow A P H A
† Member A P H A



American Journal of Public Health
and THE NATION'S HEALTH

Volume 34 March, 1944 Number 3

Food and Nutrition Policy Here and Abroad*

FRANK G. BOUDREAU, M.D.

Executive Director, Milbank Memorial Fund, New York, N. Y., and Chairman, Food and Nutrition Board, National Research Council

FOOD policy is a social and political weapon of no mean importance today. In the period immediately following the first world war very little was heard of it, it was not a subject of public discussion. Not until great food surpluses began to threaten the producers did it become a matter of wide public concern and debate. Yet food policies were adopted around 1925 which became the first links in a chain of events leading to the second world war. For the first guns fired in the war of economic nationalism, which was fought in the period between the two wars, were high tariffs and other economic weapons employed for the protection of agriculture. These measures were not taken in the interests of better nutrition or because greater food consumption was desired or as a means of bringing better food to the poorer classes. They were taken to improve a given country's trading position and to protect an agriculture whose products could not hold their own against foreign competition. High tariffs and similar trade restrictions provoke retaliation. So a chain of events was begun which led inevitably to more and more bitter economic nationalism. International trade flowed more and more slowly; the life blood of international intercourse grew anemic; agriculture in many countries became a wartime rather than a peacetime agriculture.

Unless drastic action is taken by the United Nations during and after the present war, precisely the same thing may happen again. As the occupied countries are liberated one by one, the pattern of agriculture which they will inevitably adopt will be the old pattern, the prewar pattern. And high tariffs to protect agriculture may again become the first guns fired in a new war of economic nationalism. For if the hungry millions are to be fed, all suitable land must be used for crops for

* Presented before the Food and Nutrition Section of the American Public Health Association at the Seventy-second Annual Meeting in New York, N. Y., October 14, 1943.

direct human consumption, such as cereals, potatoes, and sugar. In other circumstances the interests of better nutrition would require increased livestock production and rapid restoration of dairy herds. But the immediate task as occupied countries become liberated must be to feed the hungry millions, and this can only be done if all suitable land is planted in crops which may be directly consumed. This policy, if carried far into the post-war years, will again bring surpluses which the world market cannot absorb. It will require the highest statesmanship on the part of the United Nations to call a halt at the proper moment and to persuade governments to transform agriculture with the object of promoting human nutrition rather than of achieving the chimera of national self-sufficiency.

When the bubble of false prosperity was pricked in 1929, governments were forced to recognize the growing problem of hunger among their people. I need not recall to you the signs and symptoms of social unrest in the early 30's which persuaded governments that their only course was to provide work allowances, food, shelter, and clothing to the depressed millions. Hunger and malnutrition side by side with food surpluses which could not be sold was a spectacle which men were not prepared to tolerate. Moreover something of the vast unfolding of new knowledge of human nutrition was being spread throughout the masses, so that public opinion could not brook the idea of malnutrition and misery in the midst of plenty.

Food policies adopted here and in Great Britain during the 30's were alike in some respects but differed widely in others. In both, attempts were made to provide for the distribution of food according to need, but in this country the policy was based upon the existence of food surpluses. We had the food stamp plan whereby foods in surplus supply were provided to a part of certain low-income groups. Surplus foods and WPA assistance were the basis for an extensive system of school lunches. Surpluses of fluid milk led to various schemes for its distribution free or at low cost. The great danger in our policy was of course the possibility that food surpluses eventually would disappear, which is precisely what has happened. In Great Britain the policy was to strengthen and expand existing social measures without regard to surpluses. For a time the results were very much the same in both countries—a notable improvement in the diets of a large part of the underprivileged—but when war came food surpluses disappeared and with them the basis of our food policy, while in Great Britain war brought decreasing food supplies and increasing need to insure its equitable distribution among the population.

WARTIME ACTIVITIES

In both countries much progress has been made since September, 1939. The food policy in Great Britain has been intelligently conceived along broad lines. It is based on the distribution of food according to physiological need, a guiding principle laid down by the Food Policy Committee and closely followed by the Ministry of Food. Food production in Great Britain has been nearly doubled; milk production has been increased and practically all of it goes into human consumption. Special attention is paid to the vulnerable groups, pregnant and nursing women, infants and children, workers and low-income groups. Less food is consumed by the well-to-do, more by the poor. Best of all, a watchful eye is kept on the people's nutrition by means of dietary surveys and clinical studies so that the onset of danger may be quickly recognized.

Our own food policy has not been

so wise. In the first place the disappearance of food surpluses has destroyed the foundations of our system of food distribution to vulnerable groups, and we have been floundering around to create a new system. Full employment, higher wages, and general wartime prosperity have led many to believe that there are no longer underfed groups in the population. We have no system of dietary surveys and broad clinical studies to enable us to recognize the onset of danger. Socially minded persons in and out of the government believe that many millions have not shared in wartime prosperity and are being squeezed between low fixed incomes and higher prices for food and other necessities.

Our War Food Administration is trying hard to obtain the funds for surveys, but has met with one obstacle after another. It seems to me that health officers and health departments should be particularly anxious to encourage and promote such surveys. If they would write or speak to their representatives in Congress urging the need to provide the necessary funds in the interests of public health, I believe their influence would make itself felt. Moreover, since the states are chiefly responsible for the health of their citizens, and good nutrition is the foundation of health, it would seem that state health and local departments might themselves undertake, by rapid surveys and clinical studies, to ascertain how their vulnerable groups are faring under wartime conditions. I cannot think of any more important task for health departments at this time, and I believe a growing appreciation of their rôle in food and nutrition would do much to increase the public's understanding of their importance.

There are some items which belong on the credit side of our ledger. Fluid milk consumption has been greatly increased because so many more people can afford to buy it. But this has been accompanied by shortages of milk in some areas, and among some classes. Moreover almost half of our skim milk never gets into human consumption except indirectly through the calf or the pig. Much of the valuable milk solids in the skim milk should be kept for human consumption; this is particularly important at a time when there is a growing scarcity of animal protein, not to speak of the need for supplementing to the utmost the individual's intake of calcium. We have had some success in the feeding of war workers but here as in England much remains to be done in this field. And both here and in Great Britain the nutritional value of bread has been greatly improved; here by the restoration to flour and bread of those important nutrients which have suffered the greatest loss in milling, and in Great Britain by the use of an 85 per cent extraction flour instead of the more usual 72 per cent extraction.

POST-WAR NUTRITION PROBLEMS

Health officers and authorities in nutrition are confronted with immediate and important problems. But the post-war issues transcend all others. Food policy may be important now; it will become vital to world safety after the immediate task of feeding the hungry millions has been accomplished. What can we say about the United Nations' post-war food and nutrition policy? Fortunately some profit has come out of the bitter lessons of the past. The first conference of the United Nations on post-war issues was the conference on food and agriculture at Hot Springs, potentially one of the most important conferences ever held in any country. Without doubt one of the first international institutions to take form during or after the war will be the permanent organization in the field of food and agriculture recommended by the

conference. The food and nutrition policy of the United Nations is set out in the report of the conference; the responsible leaders of at least two of the four great powers have declared that they accept the far-reaching recommendations adopted at Hot Springs. Steps are being taken to draw up the plan and to formulate the constitution of the permanent organization. An Interim Commission, composed of a representative of each of the governments represented at Hot Springs, is dealing with these and other matters. It has recently set up panels of scientific and economic experts to advise it on the form and work of the permanent organization.

The keynote of the conference was that freedom from want means a secure, an adequate, and a suitable supply of food for every man. This goal, the conference declared, can be achieved. Thus nutrition was given its proper place as the guiding principle of food policy in every country. The only method of avoiding a return to the anarchy and economic nationalism of the past, is to make public welfare the sole criterion of food policy.

The Final Act of the conference contains 23 recommendations and resolutions; it includes 26 pages of reports on various aspects of food and agriculture. Every health officer and every nutritionist should obtain a copy and study it seriously, for it is a chart of the future course of the United Nations in food, nutrition, and agricultural policy, and it provides for the national and international mechanisms which will make possible international collaboration for the welfare of all.

These mechanisms are:

A permanent international organization for food and agriculture, possibly with regional branches.

A national nutrition organization in every country whose business it will be to formulate national food and nutrition policy.

Periodic meetings of representatives of national nutrition organizations under the auspices of the permanent organization.

The obligation of adhering governments to increase the food resources and improve the diets of their people, and to report to one another through the permanent organization on the state of their national nutrition and on the steps being taken for its improvement. Long experience in international coöperation has demonstrated that the obligation of governments to report periodically to one another is one of the best ways of assuring improvement and progress.

In contrast to 1918, when post-war issues and international relations were thought of mainly in political terms, the Hot Springs Conference dealt technically with food, nutrition, and agriculture, subjects of vital interest to ordinary men and women throughout the world. It was clear that at Hot Springs the common man and woman held the center of the stage. The conference painted a picture of how common men and women would profit in diet and health in a post-war world in which nations would work together for the welfare of all. It was a long step forward on the road to sanity in the field of food and nutrition policy.

Vital and Health Statistics in the Federal Government*

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THERE are some 25 federal agencies that routinely handle health statistics including deaths, illnesses, and physical examination findings. In terms of the numbers of records processed, the Division of Vital Statistics of the Bureau of the Census has been the largest of these organizations during peacetime, but with the tremendous increase in the size of the armed forces, the Medical Statistics Division of the Army probably exceeds it, and the Division of Preventive Medicine of the Navy rivals it.

The Division of Vital Statistics handles annually something like 2½ million live births, 75,000 stillbirths, and nearly 1½ million deaths for the country as a whole; it also tabulates about 750,000 marriages in 28 states and 50,000 divorces in 12 states. These data are processed from individual records for each event. In addition the division publishes data on patients in hospitals for the insane and mentally defective which are assembled from reports from institutions.

Because of the large number of detailed tabulations appearing as Special Reports prepared in addition to the Annual Vital Statistics volumes, the work of this division is even larger than the number of records processed would indicate.

The job of the Medical Statistics Division in the Office of the Surgeon General of the Army is the tabulation of various kinds of information about sickness, accidents, and battle casualties in the Army, and physical findings on examination of persons entering the Army.

The Medical Department of the Army assumes responsibility for the health of the soldiers, and provides a complete system of medical and hospital care. Every illness and accident for which the soldier is excused from duty for 24 hours or longer is recorded as an admission to sick report, and facts about it are tabulated, including diagnosis, days sick, and whether fatal or nonfatal. In the peacetime Army, annual admissions to sick report amounted to roughly 700 per 1,000 soldiers; the magnitude of the tabulating job with the present strength of the Army is evident, even when details are omitted from all except a sample of the cases. In the peacetime Army disability per soldier per year amounted to about 11 days, and about 10 of those days were spent in a hospital. The excellence of this medical care may be seen by contrast with the civilian population with roughly 1 day of hospital care per person per year, or about one-eighth of the days of inability to work or pursue other usual activities.

The Army Air Force has a vital statistical setup that is more or less independent of other statistics of the Army; however, the tabulations of

* Presented before the American Association of Registration Executives and the Vital Statistics Section of the American Public Health Association at the Seventy-second Annual Meeting in New York, N. Y., October 13, 1943.

sickness made by the Medical Statistics Division cover all branches of the Army.

The Navy provides similar medical care to its sailors and marines, with annual admissions to sick report during peacetime of roughly 500 per 1,000 sailors and about 9 days sick per sailor per year. The Navy Department makes the same types of tabulations as the Army. Although the total strength of the Navy is far less than the Army, annual admissions of 500 per 1,000 persons provides a lot of records for tabulation.

The Army and Navy sickness records are unique in that they refer to a definitely known population group. Although selected from the point of view of age, physical status, and conditions under which they are living, the trends of sickness in these groups are of definite interest. For the Army annual sickness rates from all causes and from many specific causes are available for nearly 125 years. Similar records for the Navy are available for long series of years.

Both the Army and Navy maintain in some form a Medical Intelligence Service whose functions are to supply detailed information on health conditions in countries in which the armed forces are likely to operate. The Division of Foreign Relief and Rehabilitation of the State Department collects similar data and also facts about medical and hospital facilities.

The Veterans Administration is already dealing in large numbers of vital records and is due for an increase. In 1942 it gave about a million clinic treatments to about 300,000 individuals, made about 900,000 examinations, and admitted 200,000 persons to hospitals. Unlike the Army and Navy, the Veterans Administration does not have a definitely known population, so is unable to compute illness rates.

Statistics in the Public Health Service are not centralized. The weekly, monthly, and annual tabulations of reported cases of notifiable diseases are handled in the Division of Sanitary Reports and Statistics, being received in tabulated form from state and city health departments. The same division publishes reports of quarantinable diseases which are received from foreign countries. The Hospital Division receives and tabulates data on admissions to the 26 Marine hospitals and on treatments in outpatient departments of those hospitals and in other Public Health Service clinics. In 1941 there were about 70,000 admissions with nearly 2 million days of hospital care, and 1½ million clinic treatments of nearly ½ million patients. The most numerous patients are Merchant Seamen, but the Public Health Service also renders medical care to the Coast Guard, to injured federal employees, and to about a dozen other types of beneficiaries. Similar records for the two large hospitals for drug addicts are handled by the Mental Hygiene Division. The statistics of the Venereal Disease Division include special research problems and also data collected in the course of the administration of the coöperative program for the suppression of venereal disease. Two large volumes on serological tests for syphilis among Army selectees have been published.

Statistics in the National Institute of Health are concerned almost entirely with special studies. The major part of the special statistical studies is done in two divisions. The statistical work of the Division of Industrial Hygiene is concerned largely with the health of industrial employees and that of the Division of Public Health Methods with illness and medical care in the general population, and with personnel and facilities available for medical care.

The Children's Bureau of the Labor Department handles a considerable

volume of health statistics, particularly in connection with the administration of laws for the improvement of maternal and infant care, for the aid of crippled children, and for the medical care of wives and infants of men in the armed forces.

The Bureau of Labor Statistics has for many years carried on research in the field of accident classification, accident frequency in representative industries, and time lost on account of industrial accidents. The Bureau of Mines of the Interior Department deals extensively in statistics of mine accidents.

The Employees Compensation Commission administers accident compensation for employees of the federal government, for private employees on navigable waters, and for private employees in the District of Columbia. During the depression this commission also assumed responsibility for injuries of persons on emergency relief work. During 1940 there were some 350,000 injuries reported, but by no means all of them were compensation claims.

In the Social Security Board, the Division of Health and Disability Studies, the Office of the Actuary, and the Bureaus of Public Assistance, Old-Age and Survivors Insurance, and Employment Security all deal in a considerable amount of health statistics. The Division of Health and Disability Studies has concerned itself largely with disability, medical care, and related matters which have or are likely to come up for consideration in connection with the extension of the types of insurance covered by the social security law. The Bureau of Public Assistance collects and analyzes data on the causes of blindness among persons receiving pensions for the blind; it also handles data on chronic diseases and impairments of the parents of children who receive compensation under the dependent children's law. The Bureau of Employment Security collects and analyzes data on physical impairments and chronic diseases which constitute a special problem in employment placement.

The Office of Education in the Social Security Agency has charge of vocational rehabilitation and is interested in handicapped individuals from that point of view. Its annual reports show the types of impairments and diseases of persons in rehabilitation training during the year.

The Wage and Hour Division of the Department of Labor gets into vital statistics because the law under which it operates authorizes exceptions to permit employment at less than standard rates or hours of persons who are unable to do a full day's work. The consideration of applications for exceptions involves not only chronic diseases and impairments, but also the more severe acute diseases causing only temporary disability in which the person wants to work during convalescence.

The Bureau of Prisons of the Department of Justice has under its charge persons in federal penitentiaries. The medical work in these institutions is done by officers of the Public Health Service supplemented by employees of the Bureau of Prisons. In 1941, in an institutional population of about 18,000, this work included a daily average census of about 1,500 hospital patients with more than ½ million days of hospital care. Some 100,000 medical and dental examinations were given.

The Farm Security Administration tabulates data on admissions to hospitals in connection with insurance plans for rural areas, which it sponsors. In addition, it has conducted physical examinations of a group of rural families to whom relief has been extended, with the idea of finding whether physical condition was a factor in the need of the farmer for relief.

The Tennessee Valley Authority

handles a large volume of both entrance physical examinations and accident statistics among employees on its projects.

The Coördinator of Inter-American Affairs has a Health Division which supports large projects for the protection of the health of workers producing war materials in the various Central and South American countries. Thus considerable data are collected on illnesses treated in clinics and hospitals operating under that organization. Although not a part of the United States Government, the Sanitary Bureau of the Pan American Union also collects and makes available to the American and other governments data on the prevalence of disease in Central and South American countries.

The Procurement and Assignment Service of the War Manpower Commission is charged with procuring physicians and dentists for the armed forces without disrupting civilian medical care. In carrying out these functions, this organization has, in coöperation with the National Institute of Health and the American Medical Association, collected a considerable body of information about the geographic distribution of medical personnel and facilities, the probable future effect upon civilian medical care of the medical recruitment program of the Army and Navy, and similar trends set in motion by the withdrawal of a large proportion of the young doctors from civilian practice.

During its existence, the National Resources Planning Board issued several studies of the health of the nation, usually as chapters in reports on more general subjects.

The agencies thus far discussed deal in some phase of health statistics other than physical examinations. The number of organizations collecting physical examination data is larger than the number handling other types of vital records. At a meeting called in 1941 by the Division of Statistical Standards of the Bureau of the Budget to consider the feasibility of standardizing the methods of coding physical findings, there were 23 representatives from 17 federal organizations which were making physical examinations and were tabulating, or expected to tabulate, the medical findings from them. The fact that so many organizations were represented shows considerable interest in this phase of health statistics.

The tabulation of the findings from the examinations of the millions of men for the Army by Local Boards was undertaken by Selective Service Headquarters. Two reports have thus far been issued on the prevalence of physical defects; the first was based on about 20,000 persons, and the second on 122,000, representing a 10 per cent sample of examinations made in 21 states prior to October, 1941.

The Railroad Retirement Board makes about 15,000 medical examinations per year of persons applying for retirement. Careful consideration is given to each case to assess the extent of the disability of the applicant. A tentative code has been set up for reporting the results of the findings at annual or other intervals.

In 1940, the Civil Service Commission added about 2,200 to its rolls of retired disabled persons. Each was medically examined and found to have some impairment or disease which justified retiring the individual. An unknown number of other persons must have been examined but not retired. The chronic diseases of persons retired for disability are shown in the Annual Report of the Commission, and also the causes of death of about 1,100 persons who died during 1940 out of the 15,000 on the retired rolls at that time.

The National Youth Administration examined in 1941 nearly 150,000 youths 16 to 24 years of age. The findings were analyzed in coöperation with

the National Institute of Health and published in detail. Originally it was the intention to examine all new entrants to N.Y.A. projects, but this aspect of the plan was abandoned even before the organization was abolished.

The Works Projects Administration had detailed plans for the examination of all of its workers to determine their fitness for the specific work to which they were assigned, but the project never got far beyond the planning stage. Some examinations were done in certain areas.

These many government agencies are all interested in vital and health statistics of the kinds mentioned above. There are no doubt other agencies which I have failed to mention in this brief summary. Some organizations are actively tabulating and publishing the results either as special papers or in annual reports. All are extremely interested in making more use of these various kinds of health statistics collected in connection with the administration of their organizations. Few if any are interested in any form of consolidated statistical organization which would take the data out of the hands of the people who have collected them and are most interested in them.

State Support of Industrial Hygiene Services—An Urgent Necessity*

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THE emergence of industrial hygiene as a major public health responsibility demanded by the war's critical need to save manpower has raised a vital question. Are we making adequate plans to hold the ground that has been gained, and to extend industrial hygiene services on the scale necessary for the successful maintenance of war production? There is much current discussion of post-war planning, which is admittedly essential for making the tremendous readjustment that will come with the war's end, but in industrial hygiene there remains imperative need for concentration on the immediate problems connected with winning the war. There is actually only a skeleton force of industrial hygiene services to meet the increasing demands of continually expanding industrial production. More personnel, more equipment, and better administrative organization are needed for the gigantic task of assisting all war industries on a multitude of health problems affecting production. The admirable improvement of industrial hygiene facilities achieved since the war began can be considered only a beginning of a program which must be further developed in the coming months.

A second question naturally follows —Who should assume the responsibility for this expansion of service? The answer is indicated by the nature of the job and by present trends. State and local health departments are the agencies which have an inherent responsibility for providing industrial hygiene services as an essential complement to all other activities of the official health program, second to none in importance. The character of this obligation is already indicated by the demands being made of existing services and the size of the task overwhelmingly evident in an appraisal of the dimensions of the growing labor force.

There are an estimated 54,000,000 workers engaged in production in this country, many of whom are women, young people, old persons, and handicapped individuals. Each day thousands of new industrial workers, replacing those called to military service, are being exposed to unaccustomed strains and dangers. New materials and new processes in manufacturing require study and careful control to eliminate hazards. Increased hours of work and higher speed of production expose workers to more risks and to fatigue. As a consequence of these factors and conditions of crowded living in industrial communities, there is increasing disability among industrial workers from both occupational disease and ordinary causes of sickness. However, complete information on the extent of occupational disease morbidity and mortality is lacking because of insufficient industrial health service, and

* Presented at a Joint Session of the Industrial Hygiene and Health Officers Sections of the American Public Health Association at the Seventy-second Annual Meeting in New York, N. Y., October 14, 1943.

inadequate reporting of known cases.

A sizable army of industrial hygiene specialists is needed to cope with all these problems at every level. How far have we advanced in organizing and training personnel to meet this challenge? In answering this question, we immediately note that industrial hygiene has only recently been generally recognized as a field in which state and local health departments should take action. We must all share the blame for this belated acceptance of industrial hygiene as a fundamental public health function, and acknowledge that it has been too long neglected in this country.

The Conference of State and Territorial Health Officers has frequently included discussion of industrial hygiene in its annual meetings, but little action resulted from these deliberations. This association should be credited, however, with maintaining interest in the general problem.

The U. S. Public Health Service admits for its part that it had not been exerting sufficient leadership in stimulating the states to take on industrial hygiene activities prior to 1936. From the time the Office of Industrial Hygiene and Sanitation was established in the Public Health Service in 1914 until that year, the work of the Division had been concentrated on investigations and surveys of industrial health hazards in the field, and in experimental laboratory studies. In 1914 there were only 2 states that had organized divisions of industrial hygiene, and in the interval before 1936, when real expansion began, only 4 more states had added this activity. Then the federal government began to take effective action, realizing that the extension of desirable industrial health practices languished for lack of promotion on the part of the federal and state governments. The Social Security Act of 1935 made possible, among other benefits, the setting up of a definite plan for establishment of industrial hygiene divisions in the states. In 1936 10 states added this function to their health department program with the aid of federal grants-in-aid. Each succeeding year since then more states have developed industrial hygiene divisions until there are now 38 states carrying on such activity.

Expansion within the states is now going on in equally vigorous fashion. Four states have already established local divisions in city and county health departments, and one other large state maintains district laboratories. The Division of Industrial Hygiene, National Institute of Health, in the Public Health Service has helped in each step of this development by providing advisory service on both technical and administrative problems. Surveys of all industrial health hazards in certain states have been made to provide evidence on which requests for appropriations could be based in setting up new state services.

The responsibilities which the state units are assuming cover a far wider field than was originally conceived. When industrial hygiene personnel visit an industry today they are presented with all kinds of problems for solution, and in turn are prepared for more varied requests than formerly when investigation of a specific occupational hazard was the only service expected on a plant visit. Today the representative of the Industrial Hygiene Division may be confronted with questions on sanitation, nutrition, communicable diseases, medical care of injuries, nursing duties, safety and health education, and a variety of related problems in addition to health hazards of work processes.

From the health department point of view, the changes in public health practice in other special fields, and the general recognition of the expanding function of health departments have been influencing the scope of industrial hygiene activities. Health administrators

are now more aware of their responsibility to extend health services to all people of their communities, and to find new ways of carrying these services to the groups who most need them. The factory is found to be a strategic place in which a large proportion of adults can be provided health services, in the same manner that the school has long served as a center for child health programs.

The much publicized facts of industrial absenteeism point out the health department's responsibility to industrial workers. It is neither accidents nor occupational diseases which cause the greatest amount of lost time from work, but the everyday causes of illness common to adults. Most state and local departments have already established services to deal with many of these problems of adult health, including tuberculosis, venereal disease, cancer, dental hygiene, mental hygiene, maternal health, and nutrition. At the same time that the health department attempts to extend these services to workers, industry is seeking the various services which health departments have to offer. It is logical that industrial employers will turn to the division of industrial hygiene for assistance in securing health department services, having first hand acquaintance with this branch of the department. It follows that the division of industrial hygiene can well act as a liaison for the other divisions of the state health department and make initial contacts with industries in arranging to have the desired services brought to industrial workers.

In addition to this coördinating function within the health department, the state division of industrial hygiene has equally important responsibilities in maintaining working relationships with other state agencies and organizations. Chief among these agencies are the state department of labor, and the industrial accident commission. Factory inspectors employed by the departments of labor to check safety measures have in some instances received training for detection of occupational disease hazards through coöperative arrangement with the divisions of industrial hygiene. Industrial accident commissions can furnish the industrial hygiene service with information on occupational diseases reported to that agency as required by law. For example, such a working arrangement is in effect in California, where the division of industrial hygiene in the health department makes investigations of the cases reported to the commission. In this state factory inspection is a responsibility of the commission. The inspectors call upon the industrial hygiene service to make technical investigations of potential health hazards which they have found in the industry. The results of these surveys are reported to the commission, since that agency is legally responsible for enforcing rules and regulations concerning protection of the health of workers. Similar relationships have been developed in Wisconsin.

In most states there is a belief that the state health department should operate in this field only on an educational plane, using its findings to persuade management that changes for correction of hazards are necessary. Education is the first approach, as in other health department activities, but the authority which may be needed in certain cases is not lacking, since every health department has sufficient power in its basic laws to take action for the prevention of occupational and other diseases.

Another function of the state health departments related to the investigation of factory conditions and securing control of hazardous conditions is the reporting of occupational diseases. In some states the law requires reporting of these diseases, usually to the health

department. However, comparatively small numbers of cases are reported in most states, which suggests that the state health department has an obligation to carry on an educational program on this specific problem. Physicians must be better informed on the nature and evidences of occupational diseases, particularly those likely to occur in the industries of their respective communities. They must acquire the same concern to report occupational disease as they generally have for reporting of communicable diseases.

Still another responsibility of state public health administrators is the establishment of adequate rules and regulations aimed at preventing occupational diseases through control of hazards. In a few states the health department is especially charged with this responsibility, in others the state agency so designated rightfully expects technical assistance from the health department. For example, the Maryland Compensation Law explicitly ascribes the duty of formulating, adopting, and administering rules and regulations designed to prevent and control occupational disease to the State Health Department and to the Baltimore City Health Department.

Similar coördinate functions of state agencies in the matter of dealing with investigation of cases of compensation claims is needed. North Carolina furnishes an example of this type of coöperation. The occupational disease law of the state provides that the Industrial Commission shall adjudicate the law and shall make investigations of health hazards in certain industries where a silicosis and asbestosis hazard exists. The commission has designated the State Board of Health as its agent and all investigations and physical examinations are conducted either by the State Board of Health or under its supervision. Public health administrators in other states should be prepared to render such services whenever called upon to do so, unless specific legislation prohibits the use in litigation of the results of investigations.

It is sometimes claimed that industrial hygiene should be administered under the direction of those agencies concerned with enforcing labor legislation such as factory inspection, wages and hours of labor, and workmen's compensation. The rôle which a health department should play in connection with compensation cases should be that of an impartial investigator of industrial health hazards. Placing such a function in the hands of the compensation agency would do away with the wholly impartial activities which we feel should be preserved.

In every state there are various non-official agencies and groups interested in promoting particular phases of industrial health with whom the state health department needs to develop effective working relationships. Among these is the state medical society, which has followed the leadership of the Council on Industrial Health of the American Medical Association in setting up a state committee for industrial health. Local medical societies are likewise being urged to develop such committees for the purpose of stimulating physicians to take active part in meeting local industrial health needs.

The state manufacturers associations are becoming more sensitive to the problems of industrial hygiene and may generally be counted on to give support to the program of the state health department. In the same manner, chambers of commerce are taking active interest under the guidance of their national Committee on Industrial Health.

Labor unions are coming to appreciate their own vital stake in the extension of industrial health services, and are making their wants and needs felt. Frequently state divisions of in-

dustrial hygiene receive requests from unions for help in investigating hazardous or unhealthful working conditions affecting their members, and for information concerning these hazards. Health departments can evolve plans for working with the labor-management health committees established in industries under the sponsorship of the War Production Board. These committees are found to be useful intermediaries for promoting all types of industrial hygiene and general health activities within the plant. They should be provided with suggestions for carrying on continuous programs.

Professional training and refresher courses are another field of responsibility for directors of divisions of industrial hygiene. Short institutes are needed for physicians, engineers, and nurses already engaged in industries to bring them up-to-date on handling the newer problems, and on the latest technics. New personnel require complete courses covering the fundamentals of their work and the relationships of the health program to the other functions of industrial management. Such courses can be developed in coöperation with universities, medical societies, industrial nursing associations and engineering societies, as many state and local industrial hygiene divisions have already shown.

Coöperation should also be given to the state departments of education for development of instruction on industrial hygiene in vocational school training courses, and in the local program of Engineering, Science, Management War Training Courses sponsored by the U. S. Office of Education.

These are only brief suggestions of the major responsibilities of a state division of industrial hygiene, but they should suffice to indicate the broadened conception of the functions of such a division. Further arguments are not needed to show that substantial support must be provided for such an important service if it is to maintain the confidence of industry and all the agencies now looking to it for assistance.

Total appropriations for these state and local units for the fiscal year 1943–1944 have now reached the sum of $1,222,295. Forty-nine and eight-tenths per cent of this total is derived from federal grants-in-aid, a slightly smaller percentage than that of the past year, since a number of states have increased the state's appropriation for this year.

When we consider the varying amounts of self-support given by the individual states to maintain their divisions of industrial hygiene, it is found that 6 states and 1 county are securing all their funds from federal grants. Seven states and 1 city depend upon federal funds for over 75 per cent of their budget for industrial hygiene. Twelve states and 1 city are aided to the extent of 50 to 75 per cent. Seven states are receiving 25 to 50 per cent, and 4 states require less than 25 per cent of federal funds. Finally, there are 4 states and 4 city divisions which receive no federal assistance, maintaining their programs entirely on their own appropriations.

During this emergency, the states are receiving much additional assistance beside federal grants in the form of loan of personnel from the Public Health Service.

Approximately 60 persons, including physicians, engineers, chemists, a dentist, and 3 nurses, are now loaned to 27 states. In several of these states these workers constitute either the entire staff or a major part of the state division. Special war appropriations made under the Emergency Health and Sanitation Act have provided for the establishment of this plan to loan both personnel and equipment to states. At the present time, states are requesting more personnel than are available, since

there has been a limiting of the number that can be added to the Public Health Service staff.

A number of states are successfully finding the only possible solution to the problem, i.e., to secure adequate state appropriations to maintain at least the minimum essential personnel to carry on their industrial hygiene programs. The obligation of the states clearly lies in this direction, since the loan of personnel by the U. S. Public Health Service can be expected to terminate with the end of the war. State health department administrators should be planning not only to replace their borrowed workers, but to augment their present staff with sufficient numbers of the various professional personnel needed to conduct an adequate and balanced program. Only 14 of the 38 state divisions have staffs consisting of more than 4 professional employees.

The total number of state personnel provided for in the budgets of state and local industrial hygiene units for the fiscal year 1943–1944, is 354. Of this total, 46 are physicians, 141 are engineers, 45 are chemists and other technical workers, 22 are nurses, 1 a dentist, and the remainder—100, are clerical workers.

Each state division should have on its staff as the minimum essential personnel to conduct industrial health surveys, a physician, an engineer, a chemist, and a nurse, supplemented by a clerical staff to assist in making reports and keeping records. Large units will require a number of each of these types of personnel. A new development is provision of advisory service in the special field of industrial dentistry. Three states have pioneered in this direction by employing a dentist to promote dental services in industry as a part of the industrial hygiene program. Already health education programs in industry require the addition of a health educator to state health department staffs for full-time assistance on industrial health education.

The essentiality of these industrial hygiene services cannot well be questioned by state legislators if the case be properly presented to them. Persuasive facts and dramatic evidence of accomplishments and needs should be brought before them now while public support can be counted on.

If action is not soon taken we may witness a demobilization of some of the state industrial hygiene units when the retrenchment of federal support takes place at the end of the war.

The type of program needed has been well demonstrated by the U. S. Public Health Service and a number of well organized state and local divisions of industrial hygiene. The Public Health Service stands ready to give continuing help to states in preparation of information for requesting state appropriations. In a recent instance, for example, a representative of our Division of Industrial Hygiene accompanied the state health commissioner of a western state on a visit to the governor, and succeeded in obtaining $20,000 from emergency funds for urgent needs of the state's division of industrial hygiene.

The appeal for state appropriations can be presented as an immediate emergency need, and at the same time postulate a permanent program to meet peacetime requirements. If need be, these requests can be met by some adjustment of the total state health department budget, curtailing some less essential activity. Too often budgets and programs once established are continued each year because inertia prevents the making of an objective appraisal of the relative merits of various programs. Now is the time for critical review of state and local health department activities, while other revolutionary changes are making adjustments easier to propose.

To make an adequate estimate of a

state's needs in industrial hygiene services, the health administrator may first have to acquire a deeper understanding of the subject, particularly if he has not had training in the field, or familiarized himself with recent developments. There may be a tendency for health officials to regard industrial hygiene as an especially technical field in which they may honestly admit having no more than a speaking acquaintance. One aid for dispelling such feelings is the *Manual of Industrial Hygiene* recently prepared by the Division of Industrial Hygiene, National Institute of Health.

The workers who receive the ultimate benefits of an industrial hygiene service deserve our best effort and consideration. They are giving their best to produce war materials which are saving us all, and the nation is thankful for their magnificent accomplishment. These home front battalions should be assured that there will be no let down of the protective program securing their own lives and health as they continue to give our fighting men the weapons for victory.

The industrial workers of our country have a right to this confidence in their health departments. For the future, they should have hope of greatly improved health safeguards in their working places as a part of the promise of a better world for all. Now is the time for laying foundations to secure these hopes.

A Severe Epidemic of Meningococcus Meningitis in Chile, 1941-1942*

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A SEVERE epidemic of meningococcus meningitis occurred in Chile in 1941–1942 (Chart 1). From June, 1941, until December 31, 1942, there were reported 5,885 cases with 928 deaths (a case fatality rate of 15.9 per cent).

As far as we know, Chile, which has a population slightly over 5,000,000, had never previously suffered an epidemic of meningococcus meningitis, except for a small outbreak of 10 cases in 1938 in a navy training school on an island. In the preceding years, only a few cases were reported annually; a total of 53 cases from 1932 to 1940, inclusive. Our population, therefore, apparently had little immunity against the disease and this fact might explain the very high incidence in this epidemic. Furthermore, the poorer classes of the population live in very crowded conditions and a survey made some time ago in the slum sections of Santiago showed an index of 7 persons per room, and an index of 2.9 persons per bed. The nutritional status of these people is rather poor, and even the weather was against us, since the winter of 1942 was particularly cold, compared with our usual climatic conditions. So we had all the requirements for the epidemic spread of a disease transmitted via the respiratory tract—lack of natural immunity, overcrowding, and conditions that would decrease individual resistance, such as poor nutrition and becoming chilled.

The epidemic began in Valparaiso, our main port. The first cases were reported from a welfare institution for children, in June, 1941, spreading rapidly through the city and then over the whole province of Valparaiso. This province has a population of 433,233 people, according to the 1940 census. The attack rate per 100,000 population in this province was 89.2 for 1941, and 188.1 for 1942.

In Santiago the first case was reported on August 25, 1941, in a young soldier. Another case occurred in another soldier within 3 days. These two men belonged to an engineers' army school. In the days immediately preceding their illness they had been working very hard in connection with some floods which occurred near the capital, and had been subjected to prolonged exposure in cold water and to strenuous physical work. The third case was in a daughter of one of the contacts of the soldiers, and the fourth case was in an army physician, who had not had actual contact with the patients, but who worked very closely with a physician who took care of the soldiers.

Knowing the particularly favorable conditions for the spread of an epidemic, we were very worried, but at that time the incidence in Santiago did not become particularly alarming. The

* Presented at a Joint Session of the Laboratory and Epidemiology Sections of the American Public Health Association at the Seventy-second Annual Meeting in New York, N. Y., October 13, 1943.

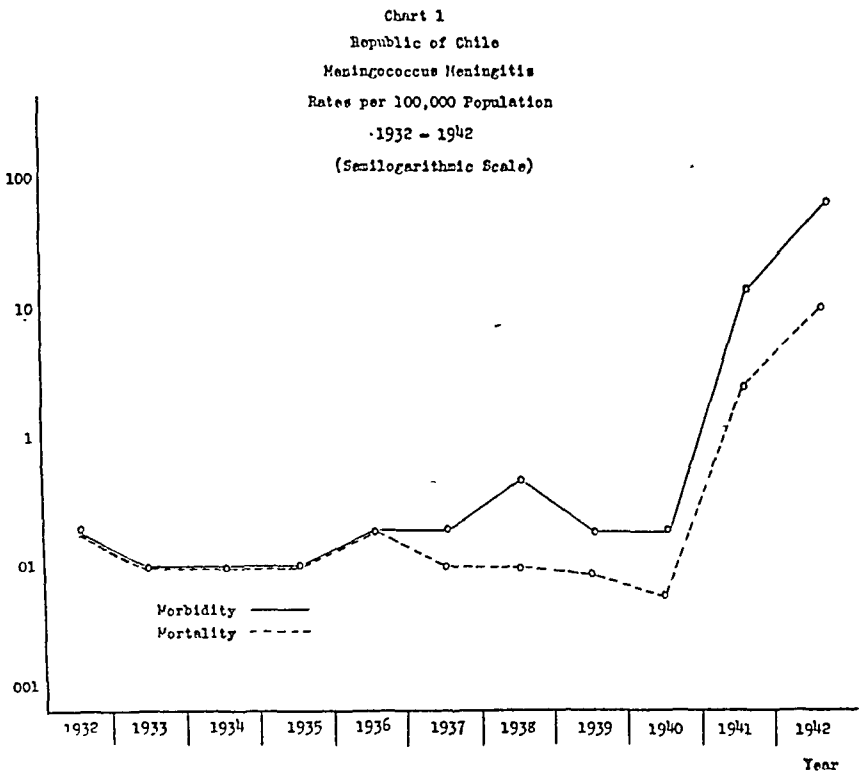


TABLE 1

Republic of Chile

Meningococcus Meningitis

Cases per 100,000 Population

Province	*1941*	*1942*	*Province*	*1941*	*1942*
Tarapaca	1.9	2.9	Nuble	0	3.2
Antofagasta	2.1	384.5	Concepcion	1.0	24.6
Atacama	0	11.5	Arauco	0	0
Coquimbo	0	2.0	Bio-Bio	0.8	6.9
Aconcagua	0	97.9	Malleco	1.3	0.6
Valparaiso	89.2	188.1	Cautin	0.3	5.5
Santiago	23.0	261.6	Valdivia	0.5	5.6
O'Higgins	1.0	35.0	Osorno	0	3.6
Colchagua	0	22.7	Llanquihue	0	4.2
Curico	1.2	18.1	Chiloe	0	1.0
Talca	0	10.0	Aysen	0	0
Maule	0	8.4	Magallanes	0	6.0
Linares	0.7	15.2			
			Total	13.6	101.3

attack rate per 100,000 population that year for the whole province was 23, a figure by far below that for Valparaiso (89.2). However, in the winter of 1942 the epidemic took an explosive form in Santiago, and the incidence for that year was 261.6 per 100,000. The epidemic, which in 1941 was localized in our two main cities, Santiago and Valparaiso, spread in 1942 all over the country, mainly in the northern and central zones and relatively sparing the southern one, as can be seen in Table 1, in which the provinces are shown in order from north to south.

AGE DISTRIBUTION

In Table 2 the age-specific morbidity and mortality rates are presented. As was to be expected, the

TABLE 2

Province of Santiago

Meningococcus Meningitis

1941–1942

Rates per 100,000 Population

Age Group	1941				1942			
	Morbidity		Mortality		Morbidity		Mortality	
	No.	Rate	No.	Rate	No.	Rate	No.	Rate
Under 1	21	56.5	13	35.0	319	838.1	108	283.8
1– 4	51	41.1	10	8.1	767	601.6	189	148.2
5– 9	54	44.4	7	5.7	618	503.2	78	63.5
10–14	46	41.3	7	6.3	538	476.5	30	26.6
15–19	37	26.0	9	6.3	386	264.3	26	17.8
20–24	25	17.4	8	5.6	248	167.9	15	10.2
25–34	28	12.3	4	1.7	361	153.9	36	15.3
35–44	17	10.9	3	1.9	218	136.6	31	19.4
45–54	9	8.7	4	3.9	94	88.4	15	14.1
55–64	2	3.6	2	3.6	32	56.3	10	17.6
65 and Over	..	...	..	...	21	54.8	11	28.7
Total	290	23.0	67	5.3	3,602	279.1	549	42.5

younger age groups suffered higher morbidity and mortality rates.

HOUSEHOLD SECONDARY ATTACK RATES

In order to study the secondary attack rates among the contacts of cases, 9,668 individuals living in the same households of actual cases were studied, according to age and the degree of overcrowding. The data are given in Table 3, from which we can make three statements: (1) 2.5 per cent of the contacts acquired the disease; (2) the secondary attack rate was higher among those under 15 years of age; and, (3) there was a statistically significant difference between the rate among those living under slight conditions of overcrowding and the rate for those living under conditions of severe overcrowding.

CARRIERS

No meningococcus carrier survey had been made of the population prior to the epidemic. During the outbreak, carrier surveys were made of various groups. A total of 12,870 individuals were cultured, among whom 429 carriers were found, giving a rate of 3.25 per cent. The rate varied from 1 per cent among the beggars in the " flop houses " (in the open all day), to 55 per cent

TABLE 3

Republic of Chile

Meningococcus Meningitis

1941–1942

Household Secondary Attack Rates

Degree of Overcrowding	Under 15 Years of Age			15 Years of Age and Over			All Ages		
	Number of Contacts	Number of Cases	Per cent	Number of Contacts	Number of Cases	Per cent	Number of Contacts	Number of Cases	Per cent
Slight	627	21	3.3	1,225	16	1.3	1,852	37	2.0
Moderate	2,059	79	3.8	2,619	40	1.5	4,678	119	2.6
Severe	1,544	64	4.1	1,594	27	1.7	3,138	91	2.9
Total	4,230	164	3.9	5,438	83	1.5	9,668	247	2.5

among the 18 men in the barracks with the 2 soldiers forming the first 2 cases.

An attempt was made to study the action of the sulfa drugs in eliminating the carrier state but, unfortunately, we had to suspend our study due to shortage of sulfa drugs. Our figures are too small to form a basis for conclusions.

TYPES OF MENINGOCOCCI

During the 4 years preceding the epidemic only 12 strains of meningococci had been recovered. Six belonged to Group III, 4 were Group I, and 2 agglutinated both Groups I and II. No Group II or IV meningococci were found.

During the early part of the epidemic, 116 strains of meningococci isolated from carriers and 53 strains from spinal fluid were typed. Among the strains isolated from carriers, Group I was more frequent than Group III (26.7 per cent compared with 3.4 per cent). Of the strains, 69.8 per cent could not be typed. Groups II and IV were not found.

Among the strains isolated from spinal fluids, on the contrary, Group III markedly exceeded Group I: 75.7 per cent compared with 9 per cent in Santiago; 70 per cent compared with 30 per cent in Valparaiso. The percentage of strains which could not be typed was low (9 per cent in Santiago and none in Valparaiso). Three strains were found in Santiago that agglutinated both Groups I and III, and were classified as intermediate strains. In neither city was Group II or Group IV found.

Without giving the technic of isolation and typing in detail, suffice it to say the swabs were streaked on the blood agar plates within 3 hours after they had been taken. Non-pigmented strains fermenting glucose and maltose were tested with the specific sera prepared with the standard strains of Sarah Branham.

The above figures as to groups are probably too small to be conclusive. The study has been continued but the results are not available as yet.

ADMINISTRATIVE PROBLEMS

Having given some of the epidemiological and bacteriological aspects of the epidemic, I would like to present now in some detail the administrative problems associated with the control of the epidemic in Santiago.

As stated before, in 1941 the epidemic was not very alarming for a province the size of Santiago (1,261,717 population). The maximum number of cases reported weekly was 24. During the first 6 months of 1942 the situation improved in that only 325 cases were reported, the weekly incidence being as low as 2 cases during the 12th week, and as high as 34 in the 26th week. However, during the first days of July (our winter), coinciding with a very low temperature for our usual climatic conditions, the epidemic took on an explosive form.

Of the 3,602 cases reported in 1942 in Santiago, 3,277, or 91 per cent, occurred during the second half of the year. In a few days we passed from an average of 22 cases per week during the preceding 2 months to 25, 40, 60, and even 75 cases *a day* at the peak of the epidemic. The public was seized with panic. As an example of the terrifying manner in which the disease struck some households, in one family of 9 persons there occurred 4 cases within 72 hours. Two of these patients died within 48 hours of onset. Three to 4 per cent of the cases among young children died in a few hours with the Friedericksen-Waterhouse syndrome in spite of intensive treatment. In some of these cases the microörganisms were so numerous that in a blood smear the red blood cells could hardly be seen for the meningococci. The Public Health Service's free communicable disease diagnostic service became swamped; it was impossible for the

diagnosticians to cover the 80 to 100 calls received each day.

At this point, Dr. Eugenio Suarez, the General Director of Public Health, requested and immediately obtained the extraordinary powers that in case of emergency are given to him by the *Sanitary Code*. Since in an epidemic of meningococcus meningitis there are not at the present time effective measures to prevent its spread, our efforts were primarily devoted to supplying prompt and adequate medical care to the patients in order to decrease the case fatality rate. Our campaign, therefore, was planned on this basis and no efforts were spared in an attempt to reach the patients in the shortest time possible. For this purpose we evacuated within 24 hours a 400 bed hospital to receive patients 5 years of age and over. For the children under 5, 100 beds were available in a children's hospital, and 60 beds were held in reserve in other hospitals. The director of the campaign moved his headquarters to the hospital and all the personnel were under his direct command. A 24 hour diagnostic service was available, staffed by 25 physicians, divided into five shifts, who worked 3 hours each day and one night of every five. Each shift included one pediatrician. This diagnostic service was available not only as a consultation service to private practitioners, but was available as well directly to the public.

This personnel was selected from the interns of the wards where the cases during the preceding year had been hospitalized. Having seen several hundred cases, these interns were very familiar with the different manifestations of meningococcus infection. Notices on the front page of all the newspapers instructed the population as to the chief symptoms of the disease, the way in which they could get the physicians' service, and that this service was absolutely free. Each physician had available at all times a car from the Public Health Service in which there was a special bag containing sulfa drugs in tablets and in solution, syringes and needles already sterilized, and cardiovascular drugs to treat the cases in collapse. They were instructed to begin the treatment at the bedside of the patient upon the slightest suspicion of meningitis. A record stating the hour at which the sulfa drug was given as well as the dose was left in the home and brought with the patient when the ambulance was sent for him.

At the admission room in the hospital the patients were carefully checked, and if the diagnosis was not clear they were sent to an observation ward where they were periodically reëxamined and sent either to the wards or to another hospital if a diagnosis other than meningitis was reached. If the physician upon his first visit to a household considered that the case could be kept under observation at his home, he reported to the hospital the hour at which a second visit should be made and his instructions were carried out by the shift that happened to be on duty at that time. For the private practitioners a 24 hour consultant service was available, and in some instances the same patient was seen 3 or 4 times within 24 hours until a final diagnosis was reached. It was expected that a visit would be made within 2 hours of each call, and for this purpose the telephone operator had a book in which the time of the call and the time at which the patient was seen were recorded, as well as the diagnosis which was made. In this way it was easy to control the efficiency of the service. Inquiries were made as to the reasons for delay, and improvements were effected if deficiencies were found. The physicians while attending the calls were in constant communication with the hospital to save time if there happened to be a new call in their neighborhood.

One night a man called the hospital saying that his son had suddenly awakened with vomiting and was complaining of severe headache. The home was seven miles from the hospital but it happened that 5 minutes later one of our physicians telephoned in and he was only 2 blocks from the patient's home. The father was astonished when he saw his call attended less than 10 minutes after he had requested our services. The case proved to be meningitis and the treatment was immediately started, 10 minutes after the known onset of the disease. Obviously this was an unique exception, but the great majority of the calls were made within the 2 hour objective. This practice of working at high speed contributed to reassure the population and to terminate the "epidemic neurosis" which had developed. Although fear was useful at the beginning of the campaign to make the public aware of the existence of the epidemic, it became a heavy burden to the medical personnel since many calls were only due to panic. Some people requested our services for merely a slight headache. The reassurement of the population was shown by the rapid decrease in the ratio of requests for services to the number of actual cases found.

Power to use the police in enforcing his resolutions was given to the director of the campaign, a weapon that can be very useful if wisely used. To show under what conditions we had to work and how compulsion sometimes is necessary to save a life, I like to relate the following experience.

One day, late in the evening, we received a telephone call from the director of an outpatient clinic belonging to one of our social security agencies, saying that a diagnosis of meningitis had been made in a baby girl 6 months old. When the mother was told that her baby was severely sick and had to be sent to a hospital at once, she refused, saying, with the fatalism that characterizes some of the lower segments of our population, that since the baby was going to die, she preferred to have her die at home. Believing that a baby's life should not depend upon the ignorance of her mother, the director of the clinic ordered a policeman to hold the woman until the ambulance came. Unfortunately, a social worker not knowing what had occurred and seeing that the mother was hysterical told the policeman to release the woman and that she would take care of the case. Upon receiving the call we went immediately to the address, in a very poor, slum area, and found nobody home. We came back that night and found from 8 to 10 people in the house, some of them drunk, but no trace of the mother or the baby. We explained to them that we were looking for the baby, trying to save her life, but they stated they did not know where the baby was. After all arguments for obtaining the new address were exhausted, we thought that we were justified in using force, and secured four policemen from the police station. Again, we tried to get the information voluntarily but upon their refusal, we told them that everybody was going to be taken to the police station and stay there as long as necessary to make the baby appear. With this threat and in view of the fact that it was a cold, rainy, winter night, they thought that it was better to give the information than to leave the house. We found the baby at 1 o'clock in the morning, 14 blocks from the original address, in a bed with her parents and 2 brothers, 2 and 4 years old, in a small room where there were 4 other people as well. The baby was immediately carried to the hospital and, fortunately, she recovered.

In the rural areas near Santiago we encouraged all the local physicians to send even suspicious cases to our hospital. Ambulances were available at strategic points and we covered the areas where, due to the low density of the population, there was no medical service readily available. One day we received a call from a rural police station in the Andes 50 miles from the capital, informing us that a man had been found unconscious in the mountains. An ambulance with a physician was sent immediately. The patient was found to be suffering from a fulminating case of the disease, and he received intravenous treatment at the police station, with ultimate recovery.

The reporting of cases by private physicians was poor. This fact was readily shown by our spot map which indicated an extremely high number of deaths in relation to the number of cases in the better residential areas of the city. This high death rate was fallacious since the wealthy people have better medical care, and could only be explained by poor reporting of cases. At our request the reporting improved slightly but still was poor. So, overnight we " froze " the sulfa drugs. The drug stores could not sell a single tablet unless the name, address and diagnosis of the patient were stated by the physician in the prescription. Furthermore, in order to save sulfadiazine for the meningitis cases, this drug could only be sold for the treatment of that disease. In case a physician needed sulfadiazine for the treatment of other conditions he had to ask permission of one of the members of a commission of 4 physicians who were available day and night: two from the Public Health Service, one representative of the medical society, and one from the surgical society. Each morning the drug stores sent a list to the offices of the Public Health Service with the names and addresses of the patients to whom sulfa drugs had been sold in the preceding 24 hours. All these patients were checked by physicians of the Public Health Service within the day, and if the conditions for proper care and isolation were satisfactory they were allowed to stay at home; if not, they had to be hospitalized. Fortunately, always after contacting the attending physician the conditions either were improved or the family accepted our suggestion as to hospitalization.

Besides the prompt and effective medical care, routine measures of control were taken. The beds in army barracks and schools were separated more than 1.4 meters, public gatherings were discouraged, the capacity of the theaters was decreased to a certain percentage of the number of seats according to the facilities for ventilation, and an adequate publicity and education campaign was conducted through radio, newspapers, and leaflets. The patients at the hospital could only be visited under special circumstances determined by the director of the campaign. Twice a day, bulletins stating the condition of the patients were issued at the hospital and at the offices of the Public Health Service downtown.

There were received at the hospital 1,658 patients from July 1 to December 31, 1942. Of these, 1,608 were meningococcus meningitis, 29 tuberculous meningitis, and 21 were suffering from other diseases and transferred to other hospitals as soon as the diagnosis was made. Of the 1,608 meningitis patients 117 died, giving a case fatality rate of 7.27 per cent which is far below the average case fatality rate for the patients who were treated elsewhere (18.9 per cent). This low case fatality rate may be due in part to the fact the case fatality rate in children under 5 years of age is particularly high and such children were treated in other hospitals, but no doubt partially to the early treatment obtained through our service, in comparison with those treated at home.

Some evidence of the effects of our campaign are possibly indicated in a comparison of case fatality rates before the campaign started and after its inception. During the second half of 1941 the case fatality rate was 23.1 per cent. During the first half of 1942 it was 22.3 per cent, while during the second half of the year when the campaign was in effect it was 14.5 per cent. This drop in the case fatality rate is statistically significant. The figures from which they were calculated include all age groups, and the treatment was the same in the 3 periods. There are

other factors, of course, which might have played a rôle in the decrease in the case fatality rate in the third period, such as better diagnosis and more complete reporting, but it is felt that it is also a reflection of the medical care program which was instituted.

In order to make a study of the case fatality rate according to the place of treatment, 1,872 records for the 3,602 patients or 51.66 per cent, were taken at random. This sample, as was expected, proved to be representative, as determined by a comparison of the age and sex distribution in the two groups. Of the 1,872 patients, 1,736 were treated in a hospital and 136 at home. The case fatality rate among the former was 12.5 per cent while among the latter it was 31.6 per cent, showing again the influence of hospitalization upon the prognosis.

An attempt was made to study the influence of the time elapsed between onset and hospitalization, and according to the duration of the disease. Sixteen hundred and sixty-seven cases were studied from this standpoint; 65.7 per cent were hospitalized within 48 hours of the onset of the disease. Of these, 45.1 per cent left the hospital before the 12th day, discharge being on the basis of clinical recovery. Among those hospitalized after 48 hours from onset a somewhat smaller percentage was discharged within 12 days, 40.4 per cent. This difference, however, is statistically significant. The case fatality rate among the two groups was practically the same, probably because the fulminating, rapidly fatal cases fell into the group receiving early care, thus counteracting the low case fatality rate established by the other cases in this group.

We will never know the actual extent of infection which occurred. All gradations were experienced from apparently completely passive carriers to the typical, textbook cases of meningococcus meningitis, which, of course, represent only a fraction of the total number of clinical conditions due to the meningococcus infection. Sore throats were not infrequently associated with almost pure cultures of meningococci. Arthritis with effusion in the joint was found to be due to the meningococcus, and many bizarre clinical conditions were encountered which I shall not take time to discuss in this paper.

In conclusion let me state that this should be considered a preliminary report since the outbreak has continued in 1943 and data are still being collected. However, the incidence this year apparently will be lower than in 1942. I have merely tried to inform you of some of our experiences in this overwhelming epidemic of meningococcus meningitis. I hope you will never have such an epidemic, but if by misfortune you do, I hope our experience may be of some help to you.

Post-War Implications of Fluorine and Dental Health*

The Use of Topically Applied Fluorine

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PRESENT knowledge and trends of evidence on the relationship of fluorine and dental health indicate that the incidence of dental caries can be reduced by either of two methods of fluorine therapy. These methods are: (1) the addition of 1 part per million of fluorine to municipal water supplies; and (2) the topical application of fluoride solution to the teeth. It is the purpose of this paper to present experience with and to discuss the relative usefulness of the second method of fluorine therapy.

The first published reports on the use of topical application of fluoride solution to the teeth of humans were made in 1942 by two independent investigators. Bibby [1] reported on the application of 0.1 per cent sodium fluoride solution to the permanent teeth of 89 children aged 10 to 13 years, and Cheyne [2] reported on the application of 0.05 per cent potassium fluoride solution to the deciduous teeth of 27 children aged 4.5 to 6 years. Both of these investigators concluded that the treatment effected a 50 per cent reduction in the incidence of dental caries. In a subsequent report on the second year of observations on the caries experience in his study group, Bibby [3] concluded that the effectiveness of the treatment had decreased slightly.

The most recent report on experience with topically applied fluoride was made by Knutson and Armstrong,[4] who obtained a 40 per cent reduction in the yearly incidence of dental caries by using a 2 per cent solution of sodium fluoride. A condensed analysis of the major findings of this study of 289 treated children and 326 negative control children, aged 7 to 15 years, will be given below.

During an 8 week treatment period the 289 children in the treated group received from 7 to 15 applications of the fluoride solution to the teeth in the upper left and the lower left quadrants of the mouth. The teeth in the right quadrants were not treated and were utilized as direct controls. The incidence of new caries in the treated and in the untreated permanent teeth during the first year after treatment are compared by mouth quadrants in Table 1. Because of the bilaterally equal occurrence of dental caries in population groups, it is expected that the

* Presented before the Oral Health Group of the American Public Health Association at the Seventy-second Annual Meeting in New York, N. Y., October 14, 1943.

TABLE 1

The Incidence of Caries in Permanent Teeth Previously Free of Caries; Comparison of Fluoride-treated and Untreated Quadrants in Each Jaw of 289 Treated Children

Item	Upper Jaw Persons	Lower Jaw Persons
Lower incidence in treated quadrant	63	48
Higher incidence in treated quadrant	26	30
Incidence equal (one or more) in treated and untreated quadrants	15	12
No new carious teeth in either treated or untreated quadrants	185	199
Total number of children	289	289

number of instances in which individuals have more caries in the left than in the right quadrants of the jaw will equal the number of instances in which the opposite result is obtained. It will be noted from the data in Table 1 that for the upper quadrants, 26 children had more, whereas 63, or 2.4 times as many children, had fewer new carious teeth in the treated than in the untreated quadrants. For the lower jaw, 30 children had more, and 48, or 1.6 times as many children, had fewer new carious teeth in the treated than in the untreated quadrants.

The number of permanent teeth that were non-carious at the time of treatment and the number of these that became carious during the following year are presented for the treated group of children in Table 2. In addition, the numbers of new carious tooth surfaces which occurred in the non-carious and in the previously carious teeth are also given. According to the data in this table, 54 non-carious teeth in the upper left and 100 in the upper right quadrant were attacked by caries; a difference of 46.0 per cent less new caries in the treated than in the untreated upper teeth. In the lower jaw, 46 new carious teeth occurred in the left and 66 in the right quadrants; a difference of 30.3 per cent less caries in the treated than in the untreated lower teeth. These findings, together with those presented in Table 1, indicate that the treatment was more effective for the upper than for the lower teeth.

As would be expected, the number of tooth surfaces attacked by caries is highly correlated with the number of teeth attacked. However, it is important to note (Table 2) that, although the numbers of tooth surfaces which became carious in previously carious teeth are lower in the treated than in the untreated teeth—49 in the treated and 57 in the untreated upper teeth, and 64 in the treated and 72 in the untreated lower teeth—the differences are relatively insignificant. Ap-

TABLE 2

Dental Caries Experience during the Year Ending in May, 1943, for the Permanent Teeth in the Fluoride-treated and Untreated Quadrants of the Jaws of 289 Minnesota Children

Quadrant	Number of Non-carious Teeth, April, 1942	New DF * Teeth, May, 1943	DF Surfaces in New DF Teeth	New DF Surfaces in Previously Carious Teeth	Total New DF Surfaces
			Upper		
Treated (left)	1,010	54	63	49	112
Untreated (right)	1,026	100	109	57	166
			Lower		
Treated (left)	1,236	46	56	64	120
Untreated (right)	1,246	66	75	72	147

DF = Carious (decayed or filled)

parently the treatment is of questionable value in preventing caries attack on the non-carious surfaces of teeth previously attacked.

The particular study under discussion was not designed to determine the minimum number of effective treatments. However, no marked difference in the amount of caries reduction was observed when the findings for the children who received 7 to 8 treatments were compared with those for the children who received 12 to 15 treatments.

Do fluoride treatments of half the teeth in the mouth affect the environment and caries experience of the untreated teeth in the other half of the mouth? In order to answer this question the caries experience of the teeth in a negative control group consisting of 326 children was studied concurrently with that in the treated group. Since the past caries experiences of the treated and of the control groups of children were quite similar, it seemed reasonable to expect that the incidence of dental caries during the study year would normally be approximately the same for both groups. Comparison of the caries experience in these two groups of children on the basis of number and percentage of teeth attacked by caries is presented in Table 3. The percentage caries attack rate (standardized for age) is 6.8 for the teeth in the untreated or right quadrants of the mouths of the treated group and 7.0 for the teeth in either the right or the left quadrants of the mouths of the control group of children. Because of the similarity in these rates it was concluded that the effect of the fluoride treatment is exclusively local during the first year following treatment.

A summary of the major findings of this most recently reported study on the topical application of fluoride to the teeth is as follows:

1. The treatment described effected a 40 per cent reduction in the incidence of dental caries during the first year following treatment. The treatment was appreciably more effective in preventing caries in the upper than in the lower teeth.
2. The treatment was of questionable value in inhibiting caries extension on the non-carious surfaces of previously attacked teeth. There was no evidence that the treatment effected an arrest of active caries.
3. During the first year after treatment, the caries inhibiting effect was confined to those teeth to which the fluoride solution was topically applied.

Before proceeding to a discussion of the usefulness of the topical application of fluoride to the teeth, it must be admitted that at present the total experience with this method for obtaining reduction in the incidence of dental caries is very meager and merely sufficient to encourage further study. However, the results of these preliminary tests have given rise to the conviction that the effectiveness of this

TABLE 3

The Number and Percentage of Non-carious Permanent Teeth Attacked by Caries during the Year Ending May, 1943, by Left and Right Mouth Quadrants; 289 Fluoride-treated and 326 Control Children, Aged 7 to 15 Years

Mouth Quadrants	*Number of Non-carious Teeth, April, 1942*	*Number of Carious Teeth, May, 1943*	*Per cent Carious (Crude Rate)*	*Per cent Carious (Standardized Rate *)*
		Treated Group		
Left (treated)	2,245	100	4.4	4.5
Right (untreated)	2,272	166	7.3	6.8
		Control Group		
Left	2,828	201	7.1	7.0
Right	2,829	220	7.8	7.0

* Numerical average of the age-specific rates

type of therapy can be improved markedly. Therefore, in order to limit the present consideration of the relative usefulness of topically applied fluorides in post-war dental health programs, this discussion will be based on the pessimistic assumption that the current indications of the prophylactic effect of the two methods of fluoride therapy will be established at the current level of apparent effectiveness and that other more efficient methods will not soon be available for use.

It has been demonstrated by Dean and his coworkers [5] that approximately 1 p.p.m. of fluoride in communal water supplies is associated with a 50 to 65 per cent reduction in the prevalence of dental caries. For the purposes of this discussion, this level of prophylactic effectiveness is accepted as the expected result of the purposeful adjustment of municipal water supplies to a fluoride concentration of 1 p.p.m. Under the foregoing assumptions it is obvious that fluoride added to water supplies is more effective in preventing dental caries than fluoride applied topically to the teeth. Furthermore, a program based on the addition of fluoride to municipal water supplies is far less costly and far less difficult to administer than one based on individual therapy. Nevertheless in considering a program for an over-all reduction of dental caries in this country, the topical application of fluoride to the teeth cannot, for several major reasons, be dismissed as only of academic interest.

First, in order to obtain the full caries-inhibiting effect of fluoride bearing waters, it is necessary that the individual depend on such supplies for his ordinary purposes of water consumption during the first 8 years of life, or during the period when the teeth (excepting third molars) are being calcified. Thus this method is of direct value to future populations only. On the other hand, the topical application of fluoride affords a preventive measure for use on the teeth of present populations.

Second, if all municipal water supplies in this country were adjusted to contain 1 p.p.m. of fluoride, approximately one-third of the population would not be covered by this form of fluoride therapy. Among that third of the population dependent on private wells or other supplies for their source of water,[6] the topical application of fluoride is a useful substitute method.

Third, since neither method of fluoride therapy is a complete dental caries prophylaxis, a periodic dental examination for the early detection and treatment of those teeth which become carious will continue to be an important health service. The topical application of fluoride to the teeth could be routinely administered with each periodic dental examination. This possibility, together with the desirability of treating teeth with fluoride soon after eruption, reduces the importance of the problem of multiple treatments. Since, for example, the eruption of the permanent teeth occurs largely during the age span 6 to 13 years, the treatment of each annual crop of newly erupted teeth would afford an opportunity to submit previously erupted teeth to renewed treatment. Furthermore, the ability to secure a concrete preventive service may constitute an important incentive for obtaining periodic dental examination and the early correction of carious and other dental defects.

There is at least a theoretical possibility that a few individuals will develop mottled enamel from fluorine-treated waters, whereas this result is not possible through the use of topically applied fluorine. However, this comparison will not be used here to discredit the former method of therapy and favor the latter. There is no evidence that 1 p.p.m. of fluoride in the

communal water supplies produces dental fluorosis of esthetic importance to the individual or that it produces deleterious effects of any health significance; it is known that higher concentrations produce both. However, the danger of overdosage is common to many of the forms of therapy in extensive use today. Therefore, an indictment of the fluorine treatment of waters on the basis of our present knowledge of the dangers of overdosage does not seem reasonable.

From the foregoing considerations, the general conclusion is that the topical application of fluoride to the teeth is very likely to afford a method of practical usefulness for reducing the incidence of dental caries in the populations of the post-war period.

SUMMARY

A review of the reported experience on the dental caries-inhibiting effect of topical applications of fluoride solution to the teeth has been presented. Present indications are that the incidence of dental caries can be reduced approximately 40 per cent by this method of fluoride therapy.

Although it is highly probable that a 50 to 65 per cent reduction in dental caries can be accomplished by the simple addition of 1 p.p.m. of fluoride to domestic water supplies, the topical application of fluoride to the teeth affords a useful adjunct or substitute method for obtaining a somewhat smaller reduction in the incidence of dental caries. There is a particular usefulness of the topical method of therapy to present populations and to that third of the population dependent on private wells for their water supplies.

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Post-War Implications of Fluorine and Dental Health*

From the Viewpoint of Public Health Dentistry

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DENTAL health programs have been adjusted to meet the needs of wartime. When peace comes, public health dentistry should direct its energies toward two goals: (1) a wider distribution of dental care in proportion to the dental disease problem, and (2) the improvement of technics in dental disease control.

Generally speaking, programs for the promotion of dental health have thus far been based on health education and on early detection and treatment of dental defects. Although all dental diseases are of special interest to public health dentistry, dental caries has been given the greatest amount of attention by virtue of the fact that the majority of dental health programs have been directed primarily toward children and because dental caries is chiefly responsible for the loss of teeth in these younger age groups.[1] There are no immediate prospects that health education and corrective programs alone will solve the dental caries problem. If we were to attempt to do so, children would need to be given approximately six times the amount of dental service they now receive for the protection of permanent teeth, as suggested in the report of the Hagerstown studies,[2] in addition to a considerable increase in the treatment of deciduous teeth. To institute such a program would require not only a greater number and a more equal distribution of dentists among the population but also health education and administrative facilities of considerable magnitude.

Public health dentistry has not heretofore been armed with an effective procedure for preventing dental caries; nevertheless, a number of dental health programs have been responsible for a material reduction in the number of untreated carious teeth and in the number of lost permanent teeth.[3, 4, 5] It is important to point out, however, that these accomplishments were effected in relatively small populations; to obtain similar results for the majority of persons in any county or state would require a vast increase in public health and dental professional facilities. Present indications give us reason to believe that dental treatment service will continue to be an essential part of any caries control program. The amount of dental treatment service needed to control caries effectively in the future will depend on how successful we are in protecting teeth against caries. There is no satisfactory evidence to show that our past efforts in preventive dentistry have materially reduced the incidence or preva-

* Presented before the Oral Health Group of the American Public Health Association at the Seventy-second Annual Meeting in New York, N. Y., October 14, 1943.

lence of caries; the same may be said for our attempts to protect teeth against caries by the use of the tooth brush and an adequate diet. Epidemiologic, chemical, and bacteriological studies indicate that the inhibiting effect of fluorine may provide us with the most effective caries control procedure thus far discovered.[6, 7] It has been suggested that the most practical application of this new knowledge would be to add non-toxic doses of fluoride to a fluoride-free public water supply.[8] It is interesting to speculate on how much the administration of a caries control program would be aided by applying this procedure in an area where fluorine is not now present in the water supplies. Laclede County, Mo., might well be taken as an example because it represents conditions which are common to many other counties in the state.

Laclede County did not have an organized dental health program prior to 1942. For a number of years this county had a peacetime ratio of 3,119 persons per dentist. The dental examination of 2,807 white children within the ages of 6–14 showed an observable caries experience rate (df rate) * of 334 decayed and filled deciduous teeth per 100 children and a dental caries experience rate in permanent teeth of 272 DMF teeth per 100 children; 7.2 per cent of the children had no observable caries experience in deciduous teeth, and 18.6 per cent of the children had no dental caries experience in permanent teeth. Of the deciduous teeth with a history of decay 65 per cent required fillings, 23 per cent were indicated for extraction, and 12 per cent were filled. Of the permanent teeth with a history of decay 69 per cent required fillings, 7 per cent were lost, and 24 per cent were filled.

In attempting to develop a dental health program for this group of children, dental treatment services would need to be given major emphasis in order that the accumulation and the yearly increment of caries lesions might be corrected. Computations were made to determine how many working hours would be required for the dentists in Laclede County to correct the dental defects resulting from carious lesions, assuming, of course, that each child would submit to the required treatment. Consideration was only given to fillings, extractions, and special services such as pulpotomies and the construction of space maintainers to correct only those conditions which were the direct result of dental caries in deciduous and permanent teeth.

It was estimated that it would require 8,344 hours of dental treatment to correct the defects resulting from carious lesions in deciduous and permanent teeth. It was also estimated that the total working time of the 6 dentists in Laclede County for one year would amount to approximately 10,800 hours. In other words, it would require four-fifths of the working time of the 6 dentists in the county to take care of the dental needs of children the first year. These estimates typify the extent of our problem and clearly indicate that public health dentistry is badly in need of a weapon for effecting mass protection against dental caries. The use of non-toxic amounts of fluoride might provide at least a partial answer to our problem. For instance, from a purely theoretical standpoint the question might reasonably be asked: To what extent would the caries problem be altered if all of the Laclede County

* The symbol "def" represents a measurement of observable dental caries experience in deciduous teeth. The def rate is obtained by: the number of decayed deciduous teeth requiring fillings + the number of decayed deciduous teeth indicated for extraction + filled deciduous teeth ÷ the number of children examined × 100 = observable dental caries experience rate per 100 children.

Lower case letters are used for the symbol "def" in contrast to the upper case letters DMF which represents dental caries experience in permanent teeth.

children had received the beneficial effects of fluoride?

Arnold compared the caries experience rates of Aurora, Ill., children, who used water containing 1.2 p.p.m. of fluoride, with the caries experience rates of the children living in Evanston, Oak Park, and Waukegan, and who used fluoride-free water. The comparison revealed that about six times as many Aurora children showed no dental caries experience and that the Aurora children had about a 60 per cent lower dental caries experience rate.[9]

By making a similar comparison with Laclede County children, and assuming that these children had used a domestic water containing approximately 1 p.p.m. of fluoride since birth, the Laclede County children might be expected to show a 60 per cent lower caries experience rate and six times as many children may have had no dental caries experience. If such conditions did exist, it is then estimated that it would only require approximately one-half of the working time of the 6 dentists in the county to correct the caries produced defects in deciduous and permanent teeth the first year. The dental caries problem would thus be brought within the range of a dental care program. In the case of Laclede County, for instance, 2 additional dentists would change the dentist-patient ratio so that 8 dentists would only be required to devote one-third of the working time to the 6–14 year age group instead of the actual circumstance whereby 6 dentists need to set aside four-fifths of their working time for this group of children.

There are, however, other factors to be considered in connection with the utilization of fluoride as a caries control procedure. It has been suggested that the addition of small amounts of fluoride, not to exceed 1 p.p.m., to fluoride-free public water supplies may be a practical and an efficient method of markedly inhibiting dental caries in large group populations.[10] Although the manipulation of public water supplies is a comparatively simple and proven method for protecting the public against disease, this procedure would only benefit persons living in cities or communities which have a public water supply. For example, in Laclede County there is at present one public water supply which is used by only 18.7 per cent of the people in the county. Thus, some means must be found to employ fluoride for the benefit of all the people.

Public health dentistry is charged with the responsibility of improving the dental health of the public by employing the most effective and efficient procedures possible. If it is shown conclusively that the addition of fluoride to water or food, or by the topical application of fluorine to teeth, produces a measure of protection against dental caries, this element should be used to the best possible advantage. On the other hand, public health dentistry is also obligated to protect the health of the people it serves and should not, therefore, use any toxic agent without adequate knowledge of its action and limitations. Reports of studies on this subject,[11, 12] indicate that if fluoride is ingested in a concentration of less than 1 p.p.m. of water, no harmful effects have thus far been discovered.

Ample evidence apparently has been presented by competent investigators that a public water supply containing fluoride will inhibit caries.[13] Much work still remains to be done to determine the proper application of this knowledge. Public health dentistry will have an important rôle in the development of new technics in public health practice if fluorine is used in dental caries control.

SUMMARY

Post-war objectives of public health dentistry should include a wider distribution of dental care and improved

technics in dental disease control.

Dental caries, one of the unsolved health problems, will not apparently be controlled adequately by health education and dental treatment service.

In an attempt to determine how much a caries control program would be aided by adding non-toxic doses of fluoride to domestic water supplies, rough estimates were made of the dentists' working hours which would be required to correct the dental defects caused by caries in children 6–14 years of age. Comparisons were made of the actual dental treatment requirements with the theoretical corrective needs if the expected benefit of fluoride were obtained.

Consideration was given to the importance of knowing the toxic effects of fluorine before this element is introduced into domestic water supplies.

The rôle of public health dentistry in utilizing fluorine in the caries control program was discussed.

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Digest of the Discussion following the Fluorine Papers

Leo Remes, D.D.S., L.D.S., R.C.S. (England), New York, N. Y.:

"In advocating the use of fluorine the epidemiologist, always seeking to apply measures which give promise of alleviating a public health hazard, may be within his province. However, as scientific men in the presence of as yet meager evidence, we should hesitate to advocate the universal use of this admittedly dangerous agent without further knowledge of its mode of action. We need to know something more about the rationale of fluorine's action in preventing caries; an acceptable hypothesis respecting the anti-enxymotic action of fluorine is still wanting. Whether fluorine acts by bathing the tooth in a fluoride bearing saliva, or by arriving at the enamel rods via the putative lymph supply of the enamel are questions which not only may determine our therapeutics but they remain as valuable safeguards against the acceptance of potentially dangerous measures on empirical grounds. Without such safeguards much harm may ensue, and a great disservice be done to dentistry."

H. T. Dean, D.D.S., Bethesda, Md.:

"Universal fluorination of domestic water supplies was not advocated in my paper. In fact it was particularly stressed that two phases of this problem still await investigation:

1. General epidemiological studies of populations exposed for a long number of years to relatively high fluoride waters in order to

learn the effects, if any, of such fluoride intake on the community's general health.

2. An experimental test embracing human populations to learn whether the addition of 1 p.p.m. of fluoride (F) to a fluoride-free water will actually reduce the amount of dental caries in the community.

"Until these two crucial fields are adequately studied any general recommendation with respect to low fluorination of domestic water supplies would be premature and unwarranted.

"It is not essential that the mode of action of the fluorine be known before setting up the test studies. Preventive medicine utilized observed natural phenomenon as a basis for far reaching control measures years before the laboratory provided the 'scientific explanation' of the phenomenon. The conversion of Jenner's observation of the protective influence of vaccinia virus in smallpox prevention rested on the purest of empirical grounds for a century. For generations scurvy and malaria were effectively controlled before either their etiology or the mode of action of the prophylactic agent was known."

John Oppie McCall, D.D.S., New York, N. Y.:

"I would like to ask Dr. Gruebbel if there has been any attempt to intensify or prolong the action of sodium fluoride when applied to the tooth surface. It is common practice, when silver nitrate is applied, to reduce it with formalin or eugenol. I should like to ask if there is any way of rendering the fluoride less soluble, after its application to the tooth, by using lime water or other compound."

Dr. Gruebbel replied that he had made no such experiment.

James M. Dunning, D.D.S., Lieut. (D.C.) U.S.N.R., New York, N. Y.:

"As evidence that preventive methods centered on oral hygiene and early treatment have produced positive results, may I say that recent studies of the Metropolitan Life Insurance Co. home office force show a decrease over fifteen years of approximately 1½ missing teeth per person in the age groups between 30 and 50. This decrease seems chiefly due to the preventive service started by Hyatt."

Allen O. Gruebbel, D.D.S., M.P.H., Jefferson City, Mo.:

"Dr. Dunning's remarks are not in conflict with the statements in my paper. It is admitted that dental programs have accomplished good results for a number of relatively small population groups, but there is no evidence that such has been the case for the public in general. The paper contained the following statements: 'There are no immediate prospects that health education and corrective programs alone will solve the dental caries problem. . . . Public health dentistry has not heretofore been armed with an effective procedure for preventing dental caries; nevertheless, a number of dental health programs have been responsible for a material reduction in the number of untreated carious teeth and in the number of lost permanent teeth. It is important to point out, however, that these accomplishments were effected in relatively small populations; to obtain similar results for the majority of persons in any county or state would require a vast increase in public health and dental professional facilities.'"

James M. Dunning, D.D.S., Lieut. (D.C.) U.S.N.R., New York, N. Y.:

"Were observations made of the gingivae and mucous membranes of your cases after treatment, and if so, were any evidences of damage, toxic or otherwise, found?

"(I missed the first part of Dr. Knutson's paper, but was told he did not cover this point in his main text. If he

did not, his answer (no damage) seems an interesting addition to his story.) "

John W. Knutson, D.D.S., Dr.P.H., Minneapolis, Minn.:

" The mouths of most of the children in our study group were observed twice a week during the eight week treatment period. There were no indications that the fluoride solution produced gingivitis or other signs of toxic damage to the soft tissue of the mouth, or to the gingivae surrounding the treated teeth."

Harry S. Thomson, D.M.D., Toronto, Ont.:

" I am very happy to be present at this meeting and to hear these reports. I must, however, express my feeling of alarm and grave concern over the possibility of too early publicity being given to findings based on, as yet, limited investigations, but which, from a news standpoint might be considered spectacular and sensational. I do hope that very creditable research such as this can be held down to purely scientific discussion until investigation by other workers reveals the full physiological action of the fluorides, from both a beneficial and an opposite effect, on the entire organism.

" We can all visualize that some energetic young reporter might take advantage of this preliminary scientific report, and the remarks made in a joking way about incorporating fluorides in ice cream and chewing gum, and make it a newspaper story that would put *his* name on the front page of the city papers, but which would be a source of great annoyance to the research workers and dental health officials.

" I make a strong plea that this matter be considered solely from a scientific point of view by the group here assembled, until further work is accomplished and reports are issued."

J. A. Salzmann, D.D.S., New York, N. Y.:

" It is gratifying to know that public health workers are following epidemiologic procedures in their attempts to control dental decay. This approach should be distinguished from efforts to ascertain causation which many research workers are pursuing, and from preventive dentistry which is nothing more than treatment of manifest dental decay. Fluorine holds forth great promise. However, we should be circumspect in our statements to the lay press, lest we arouse premature enthusiasms and popular fads and so endanger the good that may eventually come from this work."

The first two papers in this Symposium, by H. Trendley Dean, D.D.S., and Raymond J. Faust, C.E., appeared in the February JOURNAL.

Correlation of *in vitro* Sulfonamide Resistance of the Gonococcus with Results of Sulfonamide Therapy*†

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AND

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PREVIOUS studies have demonstrated that *in vitro* the gonococcus acquires resistance to gradually increased concentrations of sulfanilamide, sulfapyridine, sulfathiazole, and sulfadiazine.[1–4] It has been shown, furthermore, that induced resistance of an organism to one sulfonamide compound usually increases resistance to other derivatives of sulfanilamide.[3,5] These observations, together with an apparent decrease in the therapeutic efficacy of sulfonamides in gonorrhea, suggested the investigation of a possible correlation between the laboratory and clinical findings. Information as to the prevalence of sulfonamide resistant strains of the gonococcus in a community following the widespread use of sulfonamides would in addition provide data of epidemiologic significance. Cohn and Seijo [6] have recently reported a direct relationship between the therapeutic efficacy of sulfathiazole in patients with gonococcal infection in New York City, and the susceptibility of the patient's strain of gonococcus to the drug *in vitro*.

The present report records the results of treatment with sulfathiazole on 105 patients with gonococcal infection and the *in vitro* behavior to sulfanilamide and sulfathiazole of the strains of the gonococcus isolated from those patients. This study was carried out at the Glynn County Board of Health, Brunswick, Ga.

MATERIALS AND METHODS

Patients with symptoms of uncomplicated urethritis of cervicitis reporting at the venereal disease clinic were examined for evidence of gonococcal infection. The film and cultural methods were used to verify the diagnosis of the disease. Those from whom the gonococcus was isolated were treated with a single course of therapy consisting of 20 gm. of sulfathiazole administered in one of the two following manners: 3 gm. daily for 6 days and 2 gm. on the 7th day or 4 gm. daily for 5 days. In a few instances sulfapyrazine was sub-

* Presented before the Epidemiology Section of the American Public Health Association at the Seventy-second Annual Meeting in New York, N. Y., October 14, 1943.

† This study was carried out in coöperation with the Division of Venereal Diseases, U. S. Public Health Service, Washington, D. C.

stituted for sulfathiazole. The patients returned to the clinic for examination once a week for at least 3 weeks, and at each visit films and cultures were again taken. A series of three negative bacteriologic examinations together with the absence of clinical evidence of disease comprised the criteria of cure. Thus, patients responding to one course of therapy were considered "cured," and those requiring additional treatment were designated "failures." The 105 patients included in this study were classified according to race and sex as follows: Negro, 79; white, 26. The Negroes comprised 54 males and 25 females; the white patients, 13 males and 13 females. Included in this group were only those patients with no history of previous treatment with sulfonamide compounds.

The strain of gonococcus isolated from each patient before treatment was tested *in vitro* for growth in blood-broth media containing sulfanilamide and sulfathiazole. As a rule, the tests were carried out as soon as possible after isolation, the strains examined for the most part being between the 5th and 10th generations. In addition to the 105 strains of the gonococcus recovered from this group of patients, similar tests were made on 109 strains isolated in this same community. The observation period of the study extended from May 1, 1942, to August 1, 1943.

The medium was prepared in the following manner. Sulfanilamide to yield final concentrations of 5, 10, 20, and 40 mg. per cent was added to Douglas's broth containing 0.05 per cent each of sodium phosphate and sodium nitrate. After sterilization in the autoclave at 121° C. for 10 minutes, 5 ml. of defibrinated lapine blood were added to each 100 ml. of the medium. The sulfathiazole broth was prepared in a similar manner except that concentrations of 1, 2, 5, and 10 mg. per cent of the drug were employed. Five ml. of medium in test tubes were inoculated with 0.1 ml. of a 24 hour Douglas's broth culture of the strain to be tested. A tube of blood broth without drug was also inoculated to serve as a control. After 48 hours of incubation at 37° C. subcultures were made to "chocolate" agar plates which were similarly incubated, and the presence or absence of growth was recorded. When growth occurred in any tube containing drug, the strain was designated "resistant." If no growth was detected, the strain was considered "nonresistant." The minimal concentrations of 5 mg. per cent and 1 mg. per cent of sulfanilamide and sulfathiazole, respectively, were selected because they were significantly higher than the concentrations which were bactericidal for strains of the gonococcus isolated from patients readily cured with a single course of sulfonamide therapy.

RESULTS

Of the 105 selected patients with gonococcal infection from whom *Neisseria gonorrhoeae* was isolated prior to sulfonamide therapy, 88, or 84 per cent, were "cured" with one course of 20 gm. of either sulfathiazole or sulfapyrazine. The remaining 17, or 16 per cent, failed to be cured with the same amount of drug.

Seventy-seven strains of the gonococcus, 87.5 per cent, isolated from the 88 patients designated as "cured" failed to grow *in vitro* in any of the concentrations, 5, 10, 20, and 40 mg. per cent sulfanilamide or in concentrations of 1, 2, 5, and 10 mg. per cent sulfathiazole. The remaining 11 strains, 12.5 per cent, on the other hand, resisted the action of one or both drugs *in vitro*.

Thirteen strains of the gonococcus, 76.5 per cent, recovered from 17 patients that failed to be cured likewise remained viable when exposed to the

TABLE 1

Correlation of Effect of Sulfonamides on Neisseria gonorrhoeae in Vitro with Sulfonamide Therapy in 105 Patients

	Resistance to Sulfonamides of Strains of Gonococcus Isolated before Treatment		Clinical Results with Sulfonamide Therapy			
			Cured *		Uncured	
Strain	No. of Strains	Per cent	No. of Patients	Per cent	No. of Patients	Per cent
"Nonresistant"	81	77	77	95	4	5
"Resistant"	24	23	11	46	13	54
Total	105	100	88	84	17	16

* Criteria of cure consisted of three negative bacteriologic examinations at weekly intervals together with the absence of clinical evidence of gonorrhea.

above concentrations of sulfanilamide and sulfathiazole *in vitro*, while 4 strains, 23.5 per cent, did not survive the action of the drugs.

A correlation between the curative effect of the drugs *in vivo* and the resistance of the specific organism *in vitro* showed that of 81 patients infected with "nonresistant" strains, 77, 95 per cent, were "cured," but that of 24 patients infected with "resistant" strains, only 11, 46 per cent, were "cured" with an equivalent amount of the compound (Table 1).

Of a total of 214 strains of the gonococcus isolated prior to treatment at Brunswick, Ga., during a 15 month period from May 1, 1942, to August 1, 1943, and tested for sulfonamide resistance, 74, or 34.6 per cent, were "resistant" to sulfanilamide and sulfathiazole *in vitro*. Of greater significance, however, is the finding that only 15.2 per cent of these strains tested during the first 6 months of the study were "resistant," whereas observations made during the last 3 months showed that 59.3 per cent of all strains examined were "resistant" (Table 2).

TABLE 2

Trend of Prevalence of in Vitro Sulfonamide Resistance of the Gonococcus in Brunswick, Ga.

Time Intervals	Cultures Tested	Cultures "Nonresistant" to Sulfonamides in Vitro	Cultures "Resistant" to Sulfonamides in Vitro	"Resistant" Cultures
	No.	No	No.	Per cent
May, 1942–October, 1942	46	39	7	15.2
November, 1942–January, 1943	45	33	12	26.7
February, 1943–April, 1943	69	46	23	33.3
May, 1943–July, 1943	54	22	32	59.3
Total	214	140	74	34.6

DISCUSSION

Cohn and Seijo [6] working with 107 strains of the gonococcus isolated from 101 patients in New York City have reported that 100 per cent of the patients with "nonresistant" strains were cured, but only 18 per cent of the patients with "resistant" strains recovered. In our study, 95 per cent of the patients with "nonresistant" strains responded favorably to sulfonamide therapy as well as 46 per cent of the patients with "resistant" strains. Thus in the group reported by Cohn and Seijo, only 3 of 17 patients with "resistant" strains of the gonococcus were cured, whereas in our group, 11 of 24 patients with "resistant" strains recovered. A valid comparison of the results obtained

in the two studies cannot be made because each patient of Cohn and Seijo received during the first course of therapy only a total of 14 gm. of drug. Our patients, on the other hand, were given a total of 20 gm. each.

The investigation of the resistance *in vitro* of recently isolated strains of the gonococcus to concentrations of sulfonamide compounds comparable to those obtained in the blood of patients after sulfonamide therapy has provided information of value in shedding light on the future course of sulfonamide therapy in gonorrhea. Evidence has been accumulated to indicate that the extensive use of sulfonamide compounds, chiefly sulfathiazole, for the treatment of gonococcal infection within a period of 15 months has markedly increased the prevalence of " resistant " strains in the community in which the study was carried out This finding may possibly be attributed to the elimination of a high percentage of the " nonresistant " strains by chemotherapy, as well as to the development of " resistant " strains from exposure to the drugs *in vivo*. Inasmuch as the gonococcus acquires resistance to sulfonamides *in vitro*, undoubtedly the organism becomes resistant to the drugs *in vivo*.

The marked increase in the number of " resistant " strains isolated from untreated patients at the venereal disease clinic is striking. It is known that during the period of observation numerous patients in the community obtained sulfathiazole from local pharmacists presumably for the treatment of gonococcal infection. Therefore, self-treatment may have cured many patients infected with " nonresistant " strains of the gonococcus. Thus a proportion of patients attending the clinic may have comprised those who failed to cure themselves. It must be pointed out, however, that every effort was made to exclude previously treated patients from the study in order to eliminate strains of the gonococcus known to have been exposed to sulfonamides.

Routine tests for the sulfonamide resistance of a strain of gonococcus *in vitro* are as yet impractical because of the time and expense involved. The present study points out, however, one of the difficulties encountered in carrying out with sulfonamide therapy an intensive program for the community control of gonorrhea.

It is interesting to speculate on whether " resistant " strains of the gonococcus were distributed in man previous to the era of sulfonamide therapy, or whether strains of the organism have acquired resistance as a result of contact with the drug. Further investigations including studies of strains isolated prior to the " sulfonamide era " may answer this question.

SUMMARY

The *in vitro* response to sulfathiazole and sulfanilamide of 105 strains of *Neisseria gonorrhoeae* has been correlated with the clinical responses of the patients from whom the organisms were isolated.

Of the group of patients from whom " nonresistant " strains were isolated, 95 per cent were " cured " in 5 days with 20 gm. of sulfathiazole. On the other hand, only 46 per cent of the group with " resistant " strains responded to an equivalent amount of sulfonamide therapy.

An increase in the prevalence of sulfonamide-resistant strains of *Neisseria gonorrhoeae* from 15 to 59 per cent in 15 months was observed in Glynn County, Ga., from May, 1942, to August, 1943, following the extensive use of sulfonamide drugs as a part of a special program for the control of gonorrhea.

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NOTE: Sulfapyrazine was supplied by Mead Johnson and Company, Evansville, Ind.

Health Workers Now Subject to W.M.C. Employment Stabilization Program

The War Manpower Commission, Washington, has announced that physicians, dentists, veterinarians, sanitary engineers, and nurses who are salaried employees in essential or locally needed activities are hereafter subject to the same provisions of any employment stabilization program as applies to other workers in such activities. Such professional employees may not change their jobs without securing statements of availability from the U. S. Employment Service or being referred to new jobs by this Service. It is understood that the U.S.E.S. will make referrals of such employees only after consulting the state chairman of the Procurement and Assignment Service. The W.M.C. state directors may delegate the duty of referring such employees to new jobs to the state and local offices of the Procurement and Assignment Service if this delegation is approved by the regional W.M.C. director.

A Proposed Method for Control of Food Utensil Sanitation*

RECOGNIZING a demand on the part of health officials for a method of determining whether or not food utensils have been rendered relatively free from bacteria by the ordinary procedures followed in washing and disinfecting food utensils in public eating and drinking establishments, consideration has been given to standardizing a test for this purpose.

Many health departments now are using bacteriological methods of one kind or another for the testing of utensils for bacterial content. The technics in use include that suggested by a subcommittee of the Committee on Research and Standards of this Association as published in the *Year Book for 1936–1937*,[1] an adaptation of the swab-rinse test for milk plant equipment which appears in the 8th Edition of *Standard Methods for the Examination of Dairy Products*[2] and other modifications proposed by individuals.

Your subcommittee has given serious thought to the basic problems involved, with a view either of developing improved methods or of making a current revision of the technic proposed in 1936 for use until better methods are investigated, standardized, and made available.

As in other problems of this kind, the ideal procedure would be to determine the presence or absence on the utensils of organisms pathogenic to man. The available procedures for identifying specific pathogenic bacteria are too time-consuming and too expensive for use in routine work of this kind. Furthermore, if examinations for all pathogenic organisms were made, and they were found to be absent on the particular utensils examined, there could be no assurance that they were not present on other utensils not examined at the time, or that they would not be present another day when a disease carrier happened to patronize the establishment from which the utensils were obtained.

Another possibility would be to examine the utensils for the presence or absence of some test organism, preferably one normally present only in the upper respiratory tract of man. In addition, perhaps an examination might be made for an organism indicating finger contamination of the utensil.

In a quest for a test organism from the upper respiratory tract, Dick and Hucker[3] report finding an organism identified as *Streptococcus salivarius* on the lips of 100 unselected individuals. They also report that, without exception, each of these 100 persons deposited streptococci on the rims of sterile glasses in drinking sterile liquid therefrom. They found that the organisms survived on the rims of drinking glasses in most instances for 48 hours or more. They suggest a technic for making a presumptive test for this organism. Considerable comparative routine laboratory work needs to be done to confirm these results and to demonstrate the relative advantages and disadvantages of this test before it can be considered for standardization for routine use.

Health departments have used the

* Progress Report of the Subcommittee on Food Utensil Sanitation of the Committee on Research and Standards for 1943.

test for coliform organisms as a possible indication of finger contamination. Some workers report that the results duplicate those obtained by the swab-rinse plate count technic. However, others report an appreciable percentage of positive coliform findings in instances in which bacteria counts were acceptable. Sufficient work has not been done to determine whether or not the use of the coliform test is advantageous.

An examination of the literature reveals that the test most commonly used to date for the examination of supposedly sterilized food utensils has been some form of the swab-rinse plate count technic. There are many variations in the details of the procedures used, possibly because the test is in a formative stage and no technic has been adopted as standard by the Association. The common basis for these varied technics is the previously mentioned standard proposed in 1936 by the former subcommittee. In addition to a swab-rinse plate count method, this included a rinse plate count technic in the performance of which such articles as forks and spoons were placed in a fruit jar containing sterile water and shaken, after which a standard plate count was made on the rinse water.

It is recognized that this general method of testing has weak points. It is difficult if not impossible to remove all or a fixed percentage of the bacteria from the surface such as the rim of a glass. Also the percentage of organisms transferred from the cotton swab to the rinse solution is variable. Furthermore, the rinse solution is not a favorable menstruum for maintaining viability, so plating must be done within a few hours, otherwise marked reductions in bacterial counts result. In addition there are the well known variables of the standard plate count technic.

However, notwithstanding these acknowledged weaknesses, the practical use of the test has shown that high counts generally are associated with the use of careless methods in washing and disinfecting utensils that would permit the passage of pathogenic organisms to the supposedly cleansed and sanitized utensils if such organisms happened to be present on the utensils at the beginning of the process or if the organisms are present in the wash or rinse waters. Of course, a test result indicating the presence of organisms in small numbers gives no assurance that pathogenic organisms may not be present. However, a low count does indicate the use of rather careful methods in washing, sanitizing, and handling the utensil up to the time the test is applied. The test also is useful in process-sampling by examining utensils at various stages of the process of rinsing, washing, sanitizing, handling, and storage.

Comparing this method with tests used in similar fields of public health work, the standard plate count, with all its faults, has been useful in the early stages of the public health control of water supplies to indicate gross contamination and in the supervision of milk supplies to indicate gross carelessness in the methods used in the production, processing, and handling of milk. Other and more specific tests are assuming increasing importance with the improvement of water and milk supplies.

The work in restaurant sanitation generally is at the early stage at which a test such as the swab-rinse plate count may be useful. By the time some of the worst conditions have been improved it is possible that new and more specific tests may be devised.

As a starting point, this subcommittee has revised the swab-rinse plate count technic in the light of the experience of recent years, and submits it for further constructive criticism before proposing its acceptance by the Association as a standard test. It is recognized that this technic will not give the highest possible count but is intended to give as nearly

as possible a comparable count. Suggestions may be sent to the committee through the Association office, or directly to the Chairman, W. D. Tiedeman, New York State Department of Health, Albany, N. Y.

TECHNIC FOR THE BACTERIOLOGICAL EXAMINATION OF FOOD UTENSILS AS REVISED AND PROPOSED FOR ADOPTION AS A STANDARD METHOD BY THE SUBCOMMITTEE ON FOOD UTENSIL SANITATION OF THE COMMITTEE ON RESEARCH AND STANDARDS OF THE AMERICAN PUBLIC HEALTH ASSOCIATION IN OCTOBER, 1943

Apparatus and Materials — Sterile Petri dishes, sterile 1 ml. pipettes, standard tryptone glucose extract agar (without milk), sterile forceps or scissors, sterile cotton swabs on standard wooden applicator sticks, and sterile swab containers. Satisfactory containers consist of screw-cap swab bottles 23 by 70 mm. or 16 x 100 mm. bacteriological test tubes, with cork or rubber stoppers. Other tubes, vials or wide mouth bottles, ½ to 1 in. inside diameter and 2½ to 3½ in. high, and with mouth not less than ½ in. in diameter, may be used. Cotton plugs are not satisfactory. The swab holder may be attached to the cap or stopper, or separate dry swabs may be carried in glassine envelopes or sterile containers providing protection against contamination. The swab on the wooden applicator shall be of firmly twisted cotton, approximately 3/16 in. in diameter and ¾ in. long.

Buffered Distilled Water—The purpose is to secure a sterile solution that is non-toxic to bacteria. Prepare the phosphate buffer solution as directed in detail on page 126 of *Standard Methods for the Examination of Dairy Products*, 8th Edition (1941). Briefly, this is done by dissolving 34 gm. of potassium di-hydrogen phosphate in 500 ml. of distilled water, adding about 175 ml. of a normal sodium hydroxide solution, diluting to 1 liter with distilled water, adjusting this solution to pH 7.2, and diluting 1 ml. of this stock solution to 800 ml. with boiled and cooled distilled water. If the utensils to be swabbed are likely to contain residual chlorine, add 4 ml. of a 0.1 N sodium thiosulfate solution to the 1 ml. of stock solution before diluting it to 800 ml.

Distribute the diluted solution in the swab containers in amounts that will provide, after sterilizing in the autoclave at 121° C. for not less than 20 minutes, exactly 1 ml. for each utensil to be examined per swab; e.g., 4 ml. for 4 utensils, 5 ml. for 5 utensils, etc. The containers should be autoclaved either with the swabs in place or in separate containers and the caps slightly loosened.

Collecting Samples—Utensils to be examined shall include at least glasses, cups, and spoons, if used, and at least 4 of each shall be selected at random from the shelves or other places where clean utensils are stored. If a direct check of the dishwashing methods is desired, utensils should be selected from those recently washed. Care shall be taken to prevent contamination by handling during sampling.

Use 1 swab for each group of 4 or more similar utensils. Take the swab from a freshly opened container of dilution water or dip a sterile swab, if separate, in such dilution water, and squeeze it against the side of the container so as to remove excess water, leaving the swab moist but not wet. Rub the swab slowly and firmly three times over the significant surfaces of 4 or more similar utensils. After swabbing each utensil, return the swab to the container of dilution water, rotate the swab in the dilution water, and

press out the excess water against the side of the container before swabbing the next of the 4 or more utensils in the group.

The significant surfaces of utensils consist of the upper ½ in. of the inner and outer rims of cups and glasses and the entire inner and outer surfaces of the bowls of spoons. If it is desired to examine forks and surfaces of dishes, etc., the area to be swabbed should include the entire inner and outer surfaces of the tines of forks, and the inner surfaces of plates and bowls over an area of approximately 4 sq. in. that would come in contact with the food. The area to be swabbed on plates and bowls is to be estimated.

After completing the swabbing of all utensils in the group of 4 or more, replace the swab in the container of dilution water. Use a new swab container for the next group of utensils. Keep the containers iced while in transit to the laboratory, and plate the dilution water samples as soon as possible, preferably within 4 hours of swabbing.

Laboratory Procedure — Break the swab stick just above the cotton with sterile forceps, or cut with sterile scissors, allowing the cotton swab to drop into the diluent, where subsequent agitation should thoroughly disentangle the cotton which should be allowed to remain in the container while making transfers. Shake the swab container rapidly, making 50 round trip excursions of 4 to 6 in. with the container in one hand, striking the palm of the other hand at the end of each cycle, and completing the whole in about 10 seconds. Shaking machines may be used for time intervals found to disintegrate the cotton swab in a manner equivalent to the prescribed hand method. Transfer 1 ml. of the dilution water to a sterile Petri dish. Add approximately 10 ml. of melted standard tryptone glucose extract agar (without milk), mix, incubate for 48 hours at 35° to 37° C., and count as in making a Standard Plate Count. Avoid slight increases in temperature above 37° C., because they materially lessen the number of visible colonies that will develop. Report the count as the average plate count of organisms removed per utensil surface examined. For example, if 4 glasses are swabbed, if 1 ml. of the 4 ml. of dilution water is plated and if 56 colonies are counted after incubation, record the average plate count per glass surface as 56.

Laboratories not conforming fully with this procedure should have comparative evidence to show that the variations used give comparable results.

Interpretation — The average plate count per utensil surface examined should not exceed 100. Higher counts are presumptive evidence of inadequate cleansing or bactericidal treatment, or of recontamination by handling or during storage. Judgment should be made on the basis of repeated sampling.

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Serological Relationships within the Poliomyelitis Group of Viruses*

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EARLIER reports from this laboratory [1, 2] have described the adaptation of two strains of poliomyelitis virus (SK, MM) from monkey or man to albino mice by means of intermediary passage through cotton rats or hamsters. The resulting mouse viruses were identified by serological tests which demonstrated neutralization of both murine strains by immune sera prepared against simian poliomyelitis virus; on the other hand, neutralization of simian virus could not be obtained by antisera prepared against murine virus. Whatever immunological relationship existed between simian and murine virus was therefore non-reciprocal in character.

It seemed of interest to continue the study of these rodent viruses by immunological methods in two further directions. First, to compare the mouse-adapted strains among themselves for any relationship that might become apparent in cross-neutralization tests; second, to determine, by cross-neutralization, their immunological position in relation to Theiler's virus of spontaneous mouse encephalomyelitis. Since earlier experience [2, 3] had already demonstrated a certain degree of overlapping in serological reactivity between both murine strains (SK, MM) and antiserum prepared against Theiler's virus, the neutralization tests were planned in such a way as to permit of a quantitative interpretation of the data.

EXPERIMENTAL WORK

A brief description of the methods used in carrying out these neutralization tests follows:

Virus—The three rodent viruses (SK, MM, Theiler GDVII) were maintained by serial intracerebral passage in young Swiss albino mice. Repeated titrations at periodic intervals showed little fluctuation in potency, except for Theiler's virus which acted irregularly on intraperitoneal injection during the summer months. The experiments were therefore suspended during that time of the year. Only virus freshly harvested from completely paralyzed mice was used for neutralization tests.

Immune sera—Monovalent immune sera against the three rodent viruses (SK, MM, Theiler) were prepared in rabbits. Live virus (10 per cent brain suspensions) was injected intravenously and intraperitoneally, twice a week, in slowly increasing doses (½ ml. to 2 ml., i.v.; 5 ml. to 20 ml., i.p.) over a period of 1 month or longer. When trial sera obtained 10 days after the last immunizing injection showed a satisfactory neutralizing titer, the animals were bled out. Sera of uniformly high potency were selected and pooled, according to virus, for use in the neu-

* Aided by grants from the Dr. Philip Hanson Hiss, Jr., Memorial Fund, the Warner Institute for Therapeutic Research, and anonymous donors.

TABLE 1

Neutralization of SK Murine Poliomyelitis Virus by Homologous and Heterologous Antiviral Sera in Intracerebral and Intraperitoneal Tests

		Intracerebral Tests									Intraperitoneal Tests						
		Virus Dilution							Potency of Serum	Titer of Virus	Virus Dilution					Potency of Serum	Titer of Virus
Antiviral Sera		10^{-1}	10^{-2}	10^{-3}	10^{-4}	10^{-5}	10^{-6}	10^{-7}			10^{-1}	10^{-2}	10^{-3}	10^{-4}	10^{-5}		
SK Murine	Undiluted	3/3	9/9	9/9	10/12	4/10	2/9	1/5	10^{-6}		0/13	0/9	0/9	0/9	0/9	10^{-1}	
	1:10										0/10					10^{-1}	
	1:100										0/10					10^{-1}	
	1:500										1/6					10^{-1}	
	1:1,000										4/7						
MM Murine	Undiluted	5/5	5/5	5/5	5/5	2/5	1/5	2/5	10^{-6}		1/5	0/5	0/5	0/5	0/5	10^{-1}	
	1:10										2/5					10^{-1}(?)	
	1:100										1/5					10^{-1}	
	1:500										5/5						
Theiler Murine	Undiluted	3/3	5/5	5/5	3/3	4/5	4/5	4/5	0		0/6					10^{-1}	
	1:10										4/6						
	1:100										6/6						
	1:500										3/3						
	1:1,000										3/3						
RMV Simian	Undiluted	3/3	12/13	10/13	0/10	0/10	0/4	0/4	10^{-4}			12/15	2/15	0/15	0/15	10^{-3}	
Normal Rabbit Serum (Control)	Undiluted	5/5	7/7	12/12	12/12	12/12	10/10	8/10		10^{-7}	17/17	11/11	29/29	28/29	19/24		10^{-5}

TABLE 2

Neutralization of MM Murine Poliomyelitis Virus by Homologous and Heterologous Antiviral Sera in Intracerebral and Intraperitoneal Tests

		Intracerebral Tests											Intraperitoneal Tests											
		Virus Dilutions									Potency of Serum	Titer of Virus	Virus Dilutions									Potency of Serum	Titer of Virus	
Antiviral Sera		10^{-1}	10^{-2}	10^{-3}	10^{-4}	10^{-5}	10^{-6}	10^{-7}	10^{-8}	10^{-9}	10^{-10}		10^{-1}	10^{-2}	10^{-3}	10^{-4}	10^{-5}	10^{-6}	10^{-7}	10^{-8}	10^{-9}			
SK Murine	Undiluted		3/3	5/5	3/3	3/5	3/3	1/5	1/5	0/5	0/5	10^{-7}		15/25	5/15	1/10		0/10	0/5				10^{-2}	
	1:10													7/15	2/5									
	1:100													5/5	3/5									
MM Murine	Undiluted				6/6	6/6	6/6	2/6	3/6	2/6	1/6	10^{-7}		0/11	0/6	0/6	0/3	0/3	0/3	0/3	0/3	0/3	10^{-1}	
	1:10													0/5									10^{-1}	
	1:100													2/5										
	1:500													4/5										
Theiler Murine	Undiluted		3/3	5/5	3/3	5/5	6/8	5/5	1/5	2/5		10^{-3}		8/25	2/15	1/10		0/10	0/5				10^{-1}	
	1:10													6/14	0/5									
	1:100													5/5	5/5									
RMV Simian	Undiluted		5/5	4/5	1/5	0/5	0/5	0/5	0/5	0/5	0/5	10^{-4}		5/5	5/5	3/5	1/5	1/5	0/5	0/5	0/5		10^{-4}	
Normal Rabbit Serum (Control)	Undiluted		5/5	5/5	5/5	5/5	10/11	11/11	11/11	9/11	1/5	10^{-0}		10/10	5/5	20/20	5/5	21/23	20/21	8/11	8/11	5/6		10^{-0}

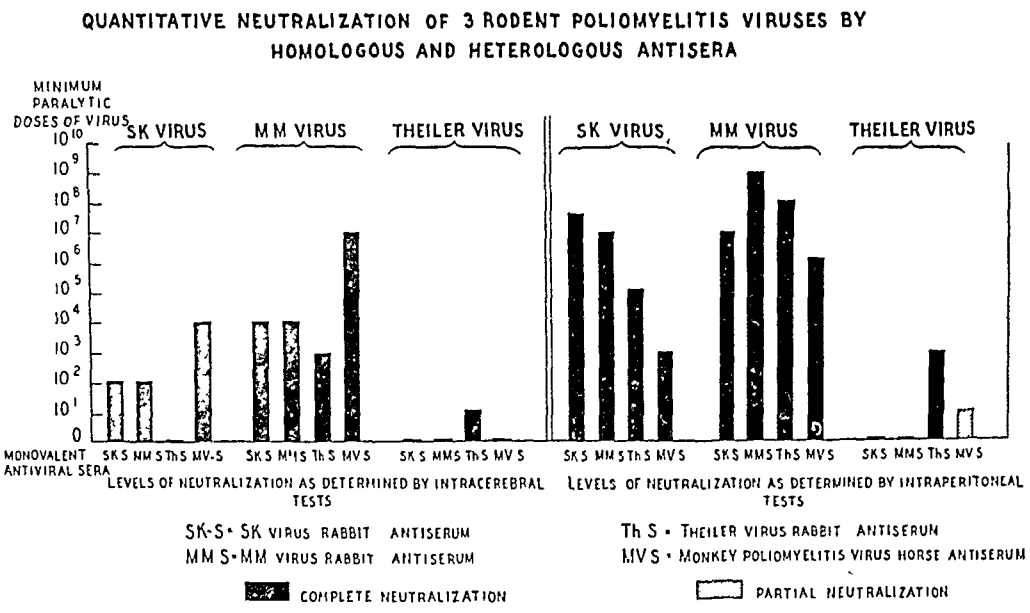
Numerator = number of mice paralyzed. Denominator = number of mice injected. For definition of potency of serum and titer of virus—see text.

tralization tests. A hyperimmune serum preparation (pseudoglobulin fraction) against simian virus, produced by immunization of horses with monkey poliomyelitis virus (RMV strain), was obtained through the courtesy of Dr. J. Toomey. According to Toomey's published data [4] this serum was capable of inactivating at least 50,000 minimal paralytic doses of simian virus as determined by intracerebral tests in rhesus monkeys.

Neutralization test—The test was carried out by adding virus to serum in definite proportions and injecting the mixtures, after incubation for 1 hour at 37° C., into groups of from 3 to 6 mice. The injections were made by either the intracerebral or the intraperitoneal route. In intracerebral tests with SK, MM, and Theiler's virus, 0.2 ml. of undiluted serum and 0.2 ml. of progressive virus dilutions were combined, and a volume of 0.03 ml. of the mixture was injected into individual mice. In intraperitoneal tests with SK and MM virus, 1 ml. of serum or serum dilution was combined with 1 ml. of virus dilution and a volume of 0.2 ml. of the mixture was injected into individual mice; for intraperitoneal tests with Theiler's virus the amounts were doubled, i.e., 2 ml. of serum were combined with 2 ml. of virus and the individual inoculum was 0.4 ml. Each test was accompanied by an adequate number of controls in which normal rabbit serum was substituted for immune serum, the technic otherwise remaining the same.

Interpretation of results—All injected mice were carefully observed for a period of from 2 to 3 weeks and the incidence of paralysis was recorded. With all three viruses paralysis was practically always followed by death. Deaths without preceding symptoms were noted on rare occasion, more often with Theiler's virus than with SK and MM virus. If these isolated deaths occurred at irregular intervals, the animal was eliminated from the entire count; the number of such eliminations was negligible. Neutralization was arbitrarily graded on the basis of the following criteria: 0 to 33⅓ per cent paralysis = complete neutralization, 34 to 66⅔ per cent paralysis = partial neutralization, 67 to 100 per cent paralysis = no neutralization. Endpoints of serum potency were calculated on the basis of the largest amount of virus in combination with the smallest amount of serum which yielded complete neutralization. Such endpoints were usually quite sharp; occasionally, however, the activity of a serum dropped irregularly over a range of virus dilutions. The titer of each virus was gauged by the highest dilution which caused from 80 to 100 per cent paralysis in the control animals. By recording the antiviral potency of a given serum, in terms of complete neutralization against multiple paralytic doses of a given virus, it became possible to arrive at a simple quantitative estimation of levels of neutralization for the several virus-serum systems. The original records, most of which represent pooled data from repeated tests, are given in Tables 1 to 3. The quantitative estimates are shown graphically in the attached diagram.

The above data which are based on a total in excess of 1,600 mice, more than 1,100 of which were used for the titration of immune sera and more than 500 for control purposes, reveal some puzzling facts. It will be observed, for instance, that SK and MM virus, in intracerebral tests, were cross-neutralized by their corresponding antisera at similar levels; intraperitoneal tests, on the other hand, show that in spite of marked overlapping in the immune reaction, each virus was best neutralized by its homologous antiserum. Intracerebral tests furthermore indicate that SK virus was not neutralized by Theiler



antiserum, in contrast to MM virus, which was markedly affected by the same serum; in intraperitoneal tests, however, both viruses were inactivated by Theiler antiserum, although to various degrees. These latter reactions appear to be strictly unilateral, for Theiler's virus, in intracerebral as well as intraperitoneal tests, remained completely refractory to neutralization by antisera against either SK or MM virus and showed only partial inactivation when tested intraperitoneally with simian hyperimmune serum.

Interestingly enough, analogous unilateral reactions are encountered again when one recalls the relationships of SK and MM virus with simian poliomyelitis

TABLE 3

Neutralization of Theiler's Mouse Encephalomyelitis Virus by Homologous and Heterologous Antiviral Sera in Intracerebral and Intraperitoneal Tests

		Intracerebral Tests									*Intraperitoneal Tests*			
		Virus Dilutions							*Potency of Serum*	*Titer of Virus*	*Virus Dilutions*		*Potency of Serum*	*Titer of Virus*
Antiviral Sera		10^{-1}	10^{-2}	10^{-3}	10^{-4}	10^{-5}	10^{-6}	10^{-7}			10^{-1}	10^{-2}		
SK Murine	Undiluted	3/3	5/5	5/5	8/8	5/5	5/5	5/5	0		14/18		0	
MM Murine	Undiluted	5/5	5/5	5/5	5/5	5/5	5/5	4/5	0		4/5		0	
Theiler Murine	Undiluted	3/3	6/6	9/9	9/9	9/9	11/14	3/9	10^{-7}		0/15		10^{-1}	
	1:10										0/9		10^{-1}	
	1:100										0/9		10^{-1}	
	1:1,000										0/5		10^{-1}	
RMV Simian	Undiluted	6/6	10/10	10/10	4/4	9/9	4/5	4/5	0		19/27		10^{-1} Partial Neutr.	
Normal Rabbit Serum (Control)	Undiluted	11/11	18/18	18/18	16/16	16/17	10/12	11/13		10^{-7}	26/30	1/17		10^{-1}

Numerator = number of mice paralyzed
Denominator = number of mice injected
For definition of potency of serum and titer of virus—see text.

virus. Thus, both murine strains were inactivated, intracerebrally as well as intraperitoneally, by anti-poliomyelitis monkey virus serum, while antisera prepared with either SK [1] or MM [5] murine virus were devoid of any neutralizing power against simian virus (SK, RMV, Aycock) in intracerebral monkey tests; similarly, Theiler convalescent mouse serum is said to be without any effect on simian poliomyelitis virus.[6] In other words, monkey (or human) poliomyelitis virus and Theiler's virus of mouse encephalomyelitis, emerge as highly specialized infectious agents which yield to complete inactivation only by contact with their homologous antisera, whereas the two mouse-adapted strains of human poliomyelitis virus (SK, MM) engage in reciprocal interaction between themselves in addition to non-reciprocal interaction with both Theiler's virus and simian poliomyelitis virus.

DISCUSSION

The foregoing observations suggest a relatively simple immunological structure for simian poliomyelitis virus as well as for Theiler's virus of mouse encephalomyelitis. By contrast, the two mouse-adapted strains of human poliomyelitis virus (SK, MM) evidently represent highly complex antigenic mosaics, including major and minor receptors, some of which seem to function like haptenes. It appears furthermore that different methods of testing may yield different results. Thus, intracerebral tests gave evidence of group- (or species-) specific and intraperitoneal tests of strain- (or type-) specific inactivation of virus. It therefore seems reasonable to assume the presence in the virus molecule of components, with varying degrees of specialization, associated, on the one hand, with virus multiplication in nervous tissue and, on the other, with virus invasion by peripheral channels. There is evidence to show that the peripherally acting component can deteriorate and become silent in the pathogenic sense, for immunization with SK tissue culture virus, harvested from remote *in vitro* generations which were no longer infective by peripheral routes (intraperitoneal, nasal, feeding), produced an antiserum capable of neutralizing SK virus, in both intracerebral and intraperitoneal tests, at levels identical with those observed with antiserum prepared with peripherally infective SK mouse passage virus.

The available data mark the two murine strains (SK, MM) as separate but closely related viruses in which homologous antigens are blended with heterologous antigens. It is also clear that both viruses have incorporated in them certain accessory fractions peculiar to simian poliomyelitis virus and to Theiler's virus.* The picture thus presented leads to an impression that human poliomyelitis virus and Theiler's virus may be natural variants of a common viral root, whereas the experimentally adapted murine viruses represent hybrid strains which occupy a position somewhere between these two fixed borders. It is probable that in such a scheme MM murine virus lies closer to Theiler's virus than does SK murine virus. Inclusion of the several viruses referred to, i.e., human, human-murine, and Theiler, in one family of intrinsically related viral agents under the designation of "poliomyelitis group"—originally proposed by us because of the variability in biological characteristics of the respective viruses [3]—appears therefore further justified in the light of the antigenic analysis just

* Recent observations by Melnick [7] which have failed to demonstrate any reaction between SK murine poliomyelitis virus and Theiler antiserum in complement-fixation tests are in agreement with the results of our intracerebral but not intraperitoneal neutralization tests. It is possible that neutralization measures immunological reactivity *in vivo* more delicately than what is indicated by complement-fixation *in vitro*.

reported. The proposed unification is based on principles similar to those that have governed recent efforts to consolidate in one "encephalitis group" certain encephalitogenic viruses which likewise engage in reciprocal and non-reciprocal immunological interaction.[8, 9] More particularly, it serves to substantiate an empirical classification, advanced by Gard [10] essentially on morphological grounds, which groups human, murine, and porcine strains of poliomyelitis virus under the same term as proposed here.

CONCLUSIONS AND SUMMARY

Cross-neutralization tests between two mouse-adapted strains of human poliomyelitis virus and Theiler's virus of mouse encephalomyelitis and corresponding antiviral immune sera revealed overlapping reactions of various degrees between the three viruses. The overlapping reactions, in some instances were reciprocal, in others non-reciprocal in character. Different results were obtained with intracerebral and intraperitoneal methods of testing, the former giving evidence of group-specific, the latter of strain-specific virus inactivation. The immunological data are discussed in their bearing on the position of the experimentally adapted murine strains in relation to Theiler's virus, on the one hand, and human poliomyelitis virus, on the other.

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The Problem of Industrial Noise*

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EXPOSURE to excessive noise is a part of the price that modern man pays for a highly mechanized civilization. The major contributions of science to the solution of the noise problem are through the marshalling of data showing that the resulting annoyance is a positive menace to the health and well-being of human beings, the development of means of measuring its physical intensity and the discovery of methods and materials for sound absorption and sound insulation which make the reduction of noise possible.

The quantitative aspect of noise, together with the decibel scale on which noise levels are represented, can best be shown as in Table 1. By comparing these levels with the levels measured in manufacturing plants we can form some conception of the acoustical environment of the men and women who are fighting the battle of production in shops and factories.

The following figures are taken from a recent paper by Hale J. Sabine and R. A. Wilson [1] giving the results of noise measurements in a number of war manufacturing plants (Table 2). These levels are of the same order of magnitude as those in boiler factories, sound intensities which otologists recognize as the cause of so-called "boilermakers' deafness."

There is a wealth of reliable data from medical sources in support of the statement that sustained exposure to noise is a "contributing factor in impaired hearing, chronic fatigue that lowers bodily resistance, neurasthenia, increased blood pressure, and decreased working and mental efficiency," and that "noise should rightfully be classified as an occupational hazard along with gases, fumes, dust, toxic liquids, and bacteria."

Bulletin 166, 1930, of the New York Department of Labor, states that of

TABLE 1

Noise Level (decibels)	*Physical Intensity*	*Example*
0	1	Threshold of hearing
10	10	Whisper at 5 feet
20	100	Very quiet room
30	1,000	Quiet private office
40	10,000	Subdued conversation
50	100,000	Business office
60	1,000,000	Ordinary conversation
70	10,000,000	Busy city traffic
80	100,000,000	Chicago elevated at street level
90	1,000,000,000	Pneumatic drill, 10 feet
100	10,000,000,000	Subway express passing local station
110	100,000,000,000	Airplane propeller noise
120	1,000,000,000,000	heard at 10 feet
130	10,000,000,000,000	Threshold of painful sound

* Presented before the Industrial Hygiene Section of the American Public Health Association at the Seventy-second Annual Meeting in New York, N. Y., October 13, 1943.

TABLE 2

Noise Levels, in Decibels, of Various Machines at a Distance of 3 Feet

Punch presses, various types	96-103
Drop hammers	99-101
Bumping hammer	100
Hydraulic press	130
Automatic riveters	95-99
Lathes (average)	80
Automatic screw machines	93-100
Airplane riveting guns	94-105
Airplane propeller grinding	100-105
Looms	94-101
Wood planers	98-110
Wood saw	100

1,040 workers in noisy industries tested for deafness, the highest percentage of hearing impairment for any age group was from the noisiest industries. Of the 246 persons in this group found to be deaf, 155 cases were traceable to industrial causes. In his work, *Occupational Disease,* W. G. Thompson [2] states that 45 per cent of locomotive crew men have impaired hearing. McCord [3] gives 52 per cent as the incidence of deafness among train dispatchers, and this occurs largely in the telephone ear—the left. Recent studies on the effects of noise in military airplanes gives the noise level in the cabin of a two-engine bomber as 115 decibels. The measured loss of hearing, after 10 hours' exposure to this noise level, is in some cases as great as 30 decibels. Only after 36 hours following exposure do most of these cases show complete recovery. In a recent paper, "Acoustic Trauma in Man," Dr. H. B. Perlman [4] states, "Many types of sound stimuli are now known to be injurious to the ear," and he lists among these the noises of pneumatically-driven tools, gasoline motors, Diesel engines, and locomotive whistles.

Occupational deafness is the most spectacular and widely recognized type of injury resulting from extreme noise. Less obvious but not less serious is the nervous fatigue which noise induces. Perlman [4] points out that in the presence of intermittent noise there is a periodic tension and relaxation of the involuntary musculature by which the fibers of the auditory nerves are protected from very loud sounds, just as the eye is protected from very intense light by the contraction of the pupil. The unconscious nervous strain produced is similar to that from a flickering light. Dr. Foster Kennedy [5] found that a sharp loud report increased the intracranial pressure by as much as fourfold. He says: "Constant noise excites and irritates, it alters conduct, it causes loss of temper and plays a part in quarrels. To overcome the effect of noise, a strain is put on the nervous system leading to neurasthenic and psycasthenic states."

Smith and Laird [6] found that in four healthy persons a decrease of 37 per cent in the number of stomach contractions results from exposure to sound levels of 80 to 90 db. Experiments on decerebrated dogs have shown that auditory stimulation produces reflex responses in the entire sympathetic nervous system. Laird [7] reports that the metabolic rate of four typists working at maximum speed decreased from 71 per cent to 52 per cent over the rate when at rest, as a result of a 7 decibel drop in the noise level.

That the ill effects of noise are not consciously recognized does not alter the fact that they exist as a constant drain on nervous and physical energy. The amazing capacity of the human species for adaptation to any environment is perhaps the sole claim which we mortals have to first place in the evolutionary scheme. But adaptation to a bad environment does not do away with the resultant evils of such an environment. Nor does it reduce the social obligation to improve it.

One of the sure ways to get remedial action under a capitalistic economy is to establish the fact that such action will yield results that can be measured in dollars and cents. About twenty-five years ago, it was found that the

noise in business offices could be reduced by the application of sound absorbent treatment to the ceiling and walls of office spaces. That this reduction added to the comfort of office workers was obvious. Proof that it yielded returns in increased output of the office force has been given by numerous investigations by office management. One of the most convincing was that made by the Aetna Life Insurance Company, and reported by P. B. Griswold to the National Office Management Association in June, 1930. Employees in the departments studied worked on a bonus system, under which bonuses were awarded on the basis of the efficiency of each department as a whole. Records of efficiency in three departments were kept for a year prior to installing absorbent treatment, and for a year afterward, all other conditions remaining constant over the whole 2 year period. The reduction in the noise level was 8 decibels, approximately 50 per cent in the loudness. The measured increase in efficiency in these departments was 8.8 per cent, the decrease in the number of errors was 25 per cent.

While the purely commercial value of quieting for office workers has become a commonplace, yet it has been only within the last few years that any serious attention has been given to the problem of noise in industrial plants. Only with the war demand for increased production and the influx of women workers into heavy industries, has the noise problem received any consideration on the part of industrial management. Dr. Foster Kennedy [5] cites the results of a study of Bogardus in 1911 to the effect that fatigue was a contributing cause in 82 per cent of 2,678 accidents examined. It is a well established fact that women are more subject to physical strain and have a greater short-sickness rate than men. If women are to retain (which God forbid) any considerable part in heavy industry then, from the standpoint of both public health and efficient management, the greater susceptibility of women to an adverse acoustical environment should be recognized.

The control of noise in industrial plants is a far more difficult problem than in business offices. Noiseless (or nearly so) typewriters, yes! But a noiseless punch press or riveter, no! The seven or eight decibels reduction to be had by absorbent treatment changes the annoyance of a noisy office to a condition of reasonable comfort. But the same reduction in the 90 or 100 decibels in a factory still leaves the din much above the comfort level. However, experience in a considerable number of recently constructed plants has shown that benefits beyond what might be expected from the mere reduction of noise level follow from acoustical treatment. Sabine and Wilson [1] state that their investigations led to the conclusion that "It is often possible for an acoustically treated area to be more comfortable than an untreated area having actually a lower noise level."

Analysis of the comments of workers in plants that had been acoustically treated disclosed that two elements, partly psychological and partly objective, contribute to the "noisiness" of a worker's environment.

The first is reverberation, that is the prolongation of a sound by repeated reflections from highly reflecting wall and ceiling surfaces. In a reverberant space, the worker has the sensation of working at a noisy machine in a noisy environment. Replacing the reflecting surfaces by absorbing surfaces reduces the environmental factor, thus markedly reducing the annoyance, even though the measured noise level is not greatly decreased. The second element is the so-called "spreading effect" of sound. In an open space the intensity of sound from a given source falls off rapidly as

the distance increases. In reverberant rooms the sound intensity from a single source is almost independent of the distance from the source—the sound spreads with little diminution with distance. As absorbent treatment greatly reduces this spreading effect, the man working at a noisy machine has the feeling of a relatively quiet surrounding. That workers recognize this effect is attested by their comments on conditions before and after acoustical treatment, such as, "The noise of that machine over there stays where it belongs," or "Before, it seemed like every machine in the plant was making noise. Now I can hear only the ones right around me." That absorbent treatment of factory walls and ceilings is worth while is evidenced by its increasing use in modern industrial plants.

Further reduction of factory noise can be obtained by intelligent planning of the plant layout. Isolation by means of effective shock mounting of heavy machines will reduce building vibrations which are transmitted with almost undiminished intensity throughout steel and concrete structures. Extremely noisy machines should be segregated from areas which would otherwise be relatively quiet. I recall one instance where the screech of a wood planer in one end of a packing room made a terrific racket for scores of girls and women who might otherwise have worked in relative quiet.

An illustration of this means of noise reduction is in the designing of airplane engine test cells. Before acceptance by the Army or Navy all engines must be subjected for many hours to extreme tests and measurements. The noise generated by a 1,500 to 2,000 horsepower internal combusion engine enclosed within concrete walls is something that would better be imagined than experienced. Levels of 130 decibels and more are created, corresponding to sound intensities 1,000 times that in the proverbial boiler factory. Yet by properly designed walls, shock mounting of the engines under test, and providing tightly closing sound insulating doors of special construction, it has been possible to secure a degree of insulation that reduces the noise level in the adjacent test rooms to levels of the order of 80 to 85 decibels. Here the solution of the noise problem was an absolute necessity for the engineers making the tests.

In spite of all that can be done, however, it must be admitted that factories where steel mightily smites steel are bound to be noisy places. Recognizing the fact that noise is a health hazard, all possible measures to protect workers from its effects should be taken. Among these should be (1) the employment of men rather than women for jobs where noise is excessive; (2) allowance of frequent rest periods to relieve the strain of prolonged exposure to noise; (3) provision of simple ear defenders for those working at extremely noisy machines (the fifteen or twenty decibel reduction afforded by a plug of cotton moistened with vaseline may make the difference between injury and safety); and (4) recognition that work in extreme noise takes more out of the worker than the same amount of labor in quiet surroundings.

The problem of noise in low-cost multiple unit dwellings has received very little, if any, attention in this country. Even in apartment houses that are well above the low-cost level, the transmission of sound between adjacent apartments and between floors is all too frequently a just cause for serious complaint. Scientific measurements have shown that for the usual types of construction the insulation for airborne sound afforded by partition walls is almost wholly a matter of their weight. Light, cheaply built walls and floors are slight barriers to the passage of sound. Today, sound insulation can

be obtained only at a price, and this price is well above the limit set by rentals for low-cost dwellings.

However, cheap means of sound insulation are not impossible. It is only that no serious research on the problem has as yet been carried out. Only when we become fully alive to the fact that quiet living conditions are essential to the health and efficiency of the industrial worker, will the question of noise receive the attention it deserves in the planning of workers' homes. We note in the news that one million dwelling units will be needed to convert from wartime to peacetime housing. Only by insistent and coöperative effort on the part of architects, scientists, and building authorities have we any hope that these new homes will be any less noisy than the boxes stacked one on top of another in which millions of workers' families now have to live.

A part of the problem of industrial noise is relief from the endless clatter and racket of urban life. The most effective and sustained effort in this direction has been put forth in New York City. This began in 1929 with the appointment of a Noise Abatement Commission by the then Commissioner of Public Health, Dr. Shirley W. Wynne. The full story of the work of that commission is contained in a comprehensive brochure under the title of "City Noise," which has served as a textbook and guide for similar campaigns in other cities.

Since that time the flood of noise in this city has ebbed and flowed with the varying zeal of city authorities in the enforcement of the police restriction on needless noise. My personal judgment as a frequent visitor is that New York is a much quieter city now than it was fifteen years ago. We all know, though, that there is still a long way to go along this road. The experience, here and in other cities, shows that sporadic and hysterical "ballyhoos," with *un*enforced police regulations against noise are futile unless coöperation of the public at large can be obtained.

To meet the need for a sustained, consistent, nation-wide campaign of education for less noise, the National Noise Abatement Council was set up five years ago. This is an association of manufacturers, civic and business groups, and others, organized for the purpose of promoting a "national consciousness of the need for noise control; to publicize the causes and the cost of noise, and ways and means for controlling and abating objectionable noises on city streets, in factories, offices, schools and homes." From small beginnings, the movement has spread and today there are in 48 of the larger cities of the country committees actively at work in carrying out the purposes of the Council. On every hand there is evidence of a growing interest in noise abatement. With the financial backing of commercial interests, the work of the Council promises to be a sane and persisting campaign for relief from an evil which all public-minded people recognize as a menace to the health and sanity of us all. Noise, once created, travels at a speed of one-fifth of a mile per second in ever-widening circles, and nothing can be done about *that*. The only effective remedy is to get people to make less of it. To get this idea across to the public at large is the goal of the National Noise Abatement Council. The coördination of the activities of the Council with those of groups attacking the problem from the standpoint of industrial hygiene should materially help in extending the zone of quiet into the whole industrial environment.

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Conference on Rheumatic Fever

A conference on rheumatic fever under the auspices of the American Heart Association was held in New York, N. Y., on January 26 and 27 to appraise the rising tide of professional and lay interest in rheumatic fever as a public health problem and to consider what can and should be done. The American Public Health Association was represented at the conference by David Rutstein, M.D., Deputy Commissioner, New York City Department of Health, and Reginald M. Atwater, M.D., Executive Secretary of the A.P.H.A.

The conference adopted the following resolutions:

1. Because of the magnitude and importance of the rheumatic fever problem, this conference is strongly in favor of the extension of public programs, supported by federal, state, and local funds, for the study, prevention, and treatment of this disease. Moreover, we believe it is essential that additional funds be secured from private sources for the purpose of special studies to increase basic knowledge of the disease, for professional education, and for increasing public awareness of the problem.

2. In order to accomplish the purposes mentioned above, this conference recommends that a Council on Rheumatic Fever be formed under the leadership of the American Heart Association, and that this council shall include representatives of interested organizations.

Subsequently the American Heart Association accepted responsibility for the formation of a Council on Rheumatic Fever and has invited the American Public Health Association, along with other agencies, to participate in the formation and work of this council through the appointment of suitable representatives. It is anticipated that the council will be an active body with its own offices, a full-time director, and a competent staff of secretaries and assistants.

The functions of the council are expected to include the formulation of adequate programs for communities of various sizes, advice to governmental, professional, and lay groups interested in the disease, and the sponsoring of research in many aspects of rheumatic fever.

The Physician's Confidential Medical Report of Cause of Death*

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EVERY sound public health program must be soundly based. Preferably that basis should be complete statistics of morbidity. No state or city in the United States, nor in any other country so far as I know, has yet attempted to adjust its public health program to this basis. Rather, communities have generally been content to develop public health programs on the basis of the reported causes of death and the reports of cases of a limited number of diseases, which are generally classified under the term "preventable."

Mortality statistics are a poor substitute for morbidity statistics as the basis of public health planning and administration. In a city like New York, for example, the discharge diagnosis for every person admitted to the municipal hospitals would probably be a much sounder basis for the public health program than the combination of statistics of mortality and preventable disease presently used. However, until the basis is changed, everything possible must be done to make our present guides as accurate as they can be. At this time, when so many of the physicians who normally practise in New York City are in the military services and those remaining in civilian practice are so hard pressed, there are many indications that the reporting of cases of illness—tuberculosis and pneumonia, to cite two important examples—is grossly incomplete. It is, therefore, of the utmost importance that the cause-of-death statistics be of the highest order.

In New York City, we are attempting to overcome the shortcomings of the traditional methods of reporting deaths and their causes by experimenting with a form of reporting deaths from natural causes in a manner which assures that the medical diagnosis will be treated as a confidential communication to the Department of Health. It is my purpose in this paper to outline briefly the legal bases for this procedure and the practical reasons which, we feel, make its adoption essential.

PERTINENT LEGISLATION

The Civil Practice Act of the State of New York provides that a physician ". . . shall not be allowed to disclose any information which he acquired in attending a patient in a professional capacity . . ." other than in the case of a crime committed upon a patient under 16 years of age,[1] except when, upon a trial or examination in open court, the prohibition cited above is expressly waived by the patient or by the personal representatives of a deceased patient.[2] Obviously, the statement of the cause of death of a person in a death certificate does not fall among the exceptions to the application of these laws.

However, the New York City Charter gives to the Board of Health of

* Presented before the Vital Statistics Section of the American Public Health Association at the Seventy-second Annual Meeting in New York, N. Y., October 12, 1943.

the City, the power to adopt a Sanitary Code which "shall have the force and effect of law,"[3] and the Charter expressly instructs the Board of Health to prescribe the persons who shall be required to file certificates of death with the department and the form of such certificates.[4] Moreover, the Administrative Code of the City authorizes the Board of Health to issue transcripts of death certificates and to determine the form of such transcripts.[5]

In accordance with these general and specific powers granted by the Charter, the Board of Health, on December 12, 1938, adopted a revision of Section 33 of the Sanitary Code perpetuating regulations requiring the reporting of deaths that have been in effect for 150 years, and providing, when deaths were due to natural causes, for the reporting of the medical diagnosis of the cause of death on a confidential medical report.

COURT RULINGS

The provisions of Section 354 of the Civil Practice Act and of Section 33 of the Sanitary Code of the City of New York would appear to be in conflict and, in fact, they are. But the Court of Appeals of the State of New York has ruled that in spite of the provision of the Civil Practice Act which apparently prohibits a physician from disclosing information regarding the illnesses suffered by a person, since deceased, it is a proper exercise of the police power granted to municipalities to require the reporting of deaths, and the causes thereof, because such information is required for *public* purposes, namely, the protection of the public health.[6]

Hence there may be no question regarding the authority of the Department of Health of the City of New York (a) to require the reporting of deaths and the causes thereof, (b) to prescribe the form and manner of reporting, (c) to issue transcripts of death certificates, and (d) to prescribe the form of such transcripts.

The highest courts of the state have apparently not passed on the propriety of the issuance of transcripts of death certificates including the cause of death as reported to it by a physician in attendance upon a patient before his death, by a department of health, because that right has not been challenged by the medical profession. But the Court of Appeals of the State of New York has ruled that a certificate of death or a certified copy thereof is not admissible in any court action between private parties, as proof of the cause of death,[6] although it has been held that such a document may be received as *prima facie* evidence of the fact of death. Hence exclusion of the cause of death from the certificate of death does not deprive persons receiving copies of essential information.[7]

PRACTITIONER'S PRACTICES

It is well known to some of us that physicians as a group will not invariably report the true cause of death on a form which will be reproduced photographically, or otherwise, and released to anyone—particularly to a relative of the decedent—for use in proving the *fact* of death of the individual in the settlement of his estate. Such a disclosure would not only violate the provisions of law mentioned above but it would also violate one of the principles of medical ethics summarized in the following quotation from the oath of Hippocrates:

"Whatsover house I enter, there will I go for the benefit of the sick. . . . Whatsoever things I see or hear concerning the life of men, in my attendance on the sick or even apart therefrom, which ought not to be noised abroad, I will keep silence thereon, counting such things to be as sacred secrets."

Even if physicians were not guided

by any such principle of professional ethics or were not prohibited by law from disclosing information they collect either through inquiry or examination in the course of treating patients, they would generally refrain from divulging such information, particularly if it should reflect unfavorably on the patient, because of the fear that the patient or his relatives might take offense and that he might in that way lose clients. Under such conditions, the Department of Health may be deprived of important and essential information.

A CONFIDENTIAL METHOD OF REPORTING CAUSES OF DEATH

Recognizing the principles cited above, a new method of reporting deaths due to natural causes has been devised and used in the Borough of Manhattan, City of New York, since January 1, 1939. The Sanitary Code covers this matter in the following terms: "The physician's confidential medical report of a death, required to be filed with such certificate of death, shall be deemed not a part of the certificate of death and shall be regarded and treated as a confidential and privileged communication, and shall not be subject to subpoena or open to inspection for any purpose whatsoever, except for scientific purposes approved by the Board of Health."

This confidential medical report, which is separate and apart from the certificate of death, is forwarded to the department in an envelope sealed by the physician. In practice, the funeral director acts as messenger and the death certificate and the confidential medical report are filed with the department at the same time. It is obvious that the confidential medical report must be filed before any burial permit can be issued.

It is to be noted that deaths when unattended by a physician, deaths that occur under unusual or suspicious conditions, as well as deaths from external cause—accidents, homicides, and suicides—are required by law to be investigated by the Office of the Chief Medical Examiner of the city and that such deaths are reported on the form of certificate in which the diagnoses are fully given. The public official who prepares such a certificate is in an entirely different category from that of the physician who attended a person during his lifetime. The law provides that, except in cases under investigation by a Grand Jury or a District Attorney, the records of the Office of the Chief Medical Examiner shall be open to inspection.

Those persons who developed the idea of having a health department issue complete copies of death certificates, including the medical diagnoses recorded by the attending physician, did not realize, I am sure, that the issuance of transcripts of death certificates might lead to a situation under which a health department would be deprived of important information—the information, in fact, that constituted the primary reason for having death registration a function of a health department.

Under the usual practices of reporting deaths and issuing transcripts, diagnoses that cause trouble between physicians and the relatives of deceased persons fall into four categories:

1. Those that tend to disgrace the memory of the deceased: congenital malformation, mental deficiency, syphilis, alcoholism, suicide, epilepsy.

2. Those that cause fear: diabetes, tuberculosis, cancer, heart disease, poliomyelitis, leprosy, smallpox.

3. Those that might reflect unfavorably upon the physician: birth injury, puerperal septicemia, infantile diarrhea, induced abortion.

4. Those that might cause difficulty in collecting insurance. (There are still some companies that disclaim all liability in the event of death from tuberculosis.) In other instances, the combination of the reported cause of death and the duration of the disease may clearly imply that a policy of insurance was obtained by fraud. I have

no knowledge of the number of instances in which controversies arise between insurance companies and the beneficiaries of life insurance policies, but I do know that they occur. If an insurance claim is contested, the person named as beneficiary in an insurance policy blames the physician, justly or unjustly, and the physician loses that person and his or her family as clients. Physicians are human, and the pressure to withhold information is great. However, any deviation from the truth tends to vitiate the statistics of death by cause and thus deprive the health department of information that is essential to the planning and administration of the public health program.

CONCLUSION

It was never contemplated—by the author, at least—that the use of this confidential method of reporting causes of death would correct all the shortcomings of cause-of-death reporting overnight. It required twenty years to achieve the desired results in Switzerland, where this method of reporting was first applied, and it will evidently require years here. A test is now being made to determine whether this method is presently yielding results that are superior to the old method of open reporting. Unfortunately, the results of this test are not yet available. One thing can be said: physicians apparently like it. When asked if they would object to extension of this form of reporting to the remainder of the city, the Medical Societies in the other four counties all voted in favor of it.

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7. Actions have been threatened, and at least one proceeded so far as to be placed on the court calendar, to compel the department by mandamus to issue a copy of the confidential medical report. These actions have invariably been withdrawn before trial.

Rôle of the Public Health Laboratory in Gas Defense*

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IT seems natural to introduce this subject with a brief discussion of the likelihood of gas attacks on civilians in this country or in Europe. Various military authorities have expressed personal opinions that Germany would resort to the use of war gases when she felt that there was something to be gained by their use. The manner in which the German "blitz" operated in the days when it was the dominant military force in the first part of the war precluded the effective use of war gases. There was no need of them and in many cases the use of persistent war gases would have resulted in slowing down the advancing armies. Now, there is another reason deterring Germany from introducing chemical warfare; that is, the knowledge that both England and the United States have plentiful stocks of chemical warfare agents, and that they are in a position to retaliate in full measure for anything which Germany may use. It seems entirely possible therefore that chemical warfare will not be initiated in the European theater of operations.

On the other hand, Japan, with its home bases relatively secure, may at any time introduce gas warfare. There is no question but that the advance army commands and the naval facilities of the Japanese fleet are equipped with gas munitions which the commander may decide to use with or without official approval of higher authority. It seems certain that Japan will not hesitate to use war gases because of humanitarian reasons.

Since December, 1941, the Office of Civilian Defense has advocated and aided in the establishment of civilian defense organizations for all cities in the United States. The establishment of complete organizations has been emphasized particularly in the coastal regions and areas bordering on the Great Lakes and Gulf Coast. Gas defense was started with the Decontamination Units which were organized at the same time as the Air Raid Warden, Auxiliary Police, Auxiliary Fire, and related units. Later, the gas defense organization was expanded to include individuals with duties specifically related to identification and protection against war gases. In many places this organization has been trained and is in a state of readiness. It should be noted that the recommended gas defense organization is considered only a basic nucleus which will be expanded if gas attacks become a reality.

Some individuals believe that no form of civilian defense will be required in this country, since they think that the Germans will have their hands full defending their own country and conquered areas. It is also felt that Japan, with the loss of its bases in the Aleutians, is not capable of attacking the continental United States. This feeling of complacency is the most im-

* Presented before the Laboratory Section of the American Public Health Association at the Seventy-second Annual Meeting in New York, N. Y., October 13, 1943.

portant thing we have to combat at the present time. Unquestionably it has become more difficult for either of these enemies to reach this country by air. It is still not impossible for them to do so. The Office of Civilian Defense, therefore, is obligated to maintain the civilian protection organization which has been established until it is certain that there will be no need for it.

The gas defense organization established by the Office of Civilian Defense for the United States comprises in the neighborhood of 10,000 volunteer workers. We expect to keep these persons enrolled for the duration of the war or until we are absolutely certain that gas will not be used on civilians in this country. This gas defense organization is made up principally of the chemically trained men of the communities and, in case of gas attacks, will form a large nucleus for the expansion of gas protection services as required.

The Office of Civilian Defense is an advisory organization to the states and consists of a staff in Washington and field staffs in nine regional offices throughout the country. At each location there are one or two individuals responsible for the organization of the gas defense program. It has been recommended that each state appoint a State Gas Consultant to be responsible for the gas defense program of the state, and most of the states have done so. Finally, it is expected that each large city will appoint a Senior Gas Officer to direct the gas defense program of the community. Under him will be found the identification officers of the Gas Reconnaissance Unit. He should also be responsible for the training of the Decontamination Unit and the direction of the unit if the need arises. In addition, all hospitals and casualty stations in the critical zones have been advised to select facilities which may be used for the cleansing of injured persons who have become contaminated with vesicant war gases. Finally, we have the Emergency Medical Service as a part of the gas defense organization, in that any physician in the service may be called upon to treat injuries due to war gases. In order to provide these doctors with the knowledge required to treat such injuries, a training program on the treatment of chemical casualties has been carried on by the medical schools of the country in coöperation with the Office of Civilian Defense.

In addition to the direct protection of persons from these agents, it is also important that their food and water be protected. In case of a gas attack, considerable contamination of both food and water may occur. The contamination of large supplies of water such as city reservoirs is not very likely, since enormous amounts of war gases would be required to make the water unsafe to drink. This is particularly true if the stored water is subjected to a purification process from which it is pumped directly into the water supply system. Purification processes such as chlorination, coagulation, sedimentation, and filtration will ordinarily remove almost any war gas contaminant, although there are a few exceptions. Contamination can be detected quickly by marked changes in the pH of the water, in the chlorine demand, and in the chloride content of the water. The purity of a public water supply is the responsibility of the city department regulating the water supply, but in most cases the health department must ascertain by analysis whether or not such water is safe to drink. In times of emergency, these responsibilities are not changed, but routine purification and analyses are not sufficient. Special precautions must be taken to insure that the enemy attacks have not disturbed the safety of the drinking water. If war gases have been used, special tests for such materials should be inaugurated to insure that contamination will be detected as

soon as it occurs. The tests mentioned above are not specific, but are easy to perform and are good indications of contamination. In contrast to public water supplies, private water supplies might easily be contaminated during war gas attacks from the air and any such supplies in a gassed area should be sampled and analyzed by the health department as soon as possible after such attacks.

The chief duty of the health department of any city is to protect the health of the community under enemy attack as well as in peacetime. In the case of an enemy attack, the problem becomes more difficult, even if only explosive bombs are used, and still more difficult if these bombs are mixed with war gases. All sources of food and all food supplies in an area contaminated by war gases must be examined, therefore, before such sources or such foods are permitted to be used. This is the chief problem which will confront the health department in case war gases are used.

It will not be the responsibility of the Senior Gas Officer of the community to certify that food and water are or are not contaminated. However, he will indicate to the health department laboratory what areas have been contaminated and his organization will aid in the collection of food samples for analysis and in carrying out the orders of the health department. In many cases it may be advisable to utilize the services of the Gas Reconnaissance Unit in the inspection of suspected foods, since a widespread area of contamination would require the work of a considerable number of individuals in order to carry out such inspections. In most cases, the staff of the Senior Gas Officer is composed of individuals experienced in chemistry with special training in chemical warfare. With rather brief instruction it should be possible to utilize them very satisfactorily in carrying out this necessary work of inspecting suspected foods.

The public health laboratory should therefore be prepared to analyze food, milk, and water for war gases. All the common war gases can be detected specifically by means of reactions which are described in the literature and in standard reference books on the subject of war gases. Two books of particular value are Jacobs' *War Gases, Their Decontamination and Identification,* and Sartori's *The War Gases.* Memorandums on the detection of war gases in water have been prepared and can be obtained from the Stream Pollution Investigations Station of the U. S. Public Health Service at Cincinnati, Ohio. In addition to these sources the Office of Civilian Defense has recently published a memorandum on " Identification of Chemical Warfare Agents " which will be available from the Government Printing Office. The samples can be analyzed qualitatively by aspirating air from the sample bottle or flask over sensitized paper, or through silica gel or an absorbing solution. The absorbent solution or gel can then be tested for the agent. Most of the chemical reactions used in the identification of chemical warfare agents can be very satisfactorily performed on silica gel without eluting the absorbed gas.

Many public health laboratories have sent members of their organizations to gas specialist courses given under the auspices of the Office of Civilian Defense at War Department civilian protection schools and at state gas specialist schools. These men have been given sufficient training to carry out any necessary analyses. In some states this gas specialist training is still being carried on, and any member of a public health laboratory who so desires can obtain some training under this state training program. Almost every large city of this country has appointed a Senior Gas Officer, and he has received training at one of these sources.

If the public health laboratory desires assistance in training its men, he will invariably be eager to coöperate with them in seeing that such training is provided.

To summarize briefly let me say that the Office of Civilian Defense and the civilian defense organizations of the local communities are relying upon the health departments to coöperate in the overall gas defense program by providing protection of the food and water supplies in case of emergencies caused by gas attacks.

American Journal of Public Health
and THE NATION'S HEALTH

Official Monthly Publication of the American Public Health Association

Volume 34 March, 1944 Number 3

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THE EDITOR RESIGNS

DR. HARRY STOLL MUSTARD has resigned as Editor of the JOURNAL. The Editorial Board makes this announcement with profound regret and with the free admission that the resignation, offered some months ago, was accepted only after it was abundantly clear that no argument or persuasion could prevail upon him to change his mind.

The Board believes it speaks for the JOURNAL's 10,000 readers when it expresses gratitude for the good fortune which retained Dr. Mustard's interest for as long as three years and two months. He is a busy man, a much sought-after man. Competition for his attention is always keen and never more so than in these war years. There must have been many occasions when matters of great weight and urgency wholly absorbed him, cruelly consuming mental and physical energy. A lesser person would have found intolerable the sustained demands of a monthly magazine and promptly sloughed them off. We know he has had long absences from the country, preceded and followed by close-packed weeks of attention to continuing commitments. The JOURNAL was only one of many. Yet every editorial, save two, which has appeared from January, 1941, through February, 1943, has come from his pen. Their thoughtfulness, their exact scientific focus, their penetration, their climactic punch-lines give evidence in every finished period of the painstaking care with which they were prepared. Time went into them, with time at a premium, and there was always a dead-line, and the writing of two and sometimes three editorials a month was by no means all the Editorship entailed. Dr. Mustard himself did nothing by proxy and he held others to the same punctilious ideal. One of his first official acts as Editor was to set down, in unequivocal terms, his convictions about book reviewing. "Books accepted for review by a person should be reviewed by that person," he wrote, "and not by an associate. If the reviewer finds that he cannot himself undertake the task, he should return the book to the editorial office." In that same letter occurs the famous line that many a recipient has chuckled over—"Reviewers should avoid cliches, jargon and ostentatious polysyllabics." It is a rule which scrupulously governs his own writing. He read every book review and graded it, to remind

himself later of the competence of the reviewer. He was conscientious in acknowledging and commenting upon manuscripts offered for his opinion. In short, he worked at the job, and somehow extended his days and himself to encompass it, and to do it superbly, as he has done with all the other things dependent upon him for guidance, direction, and completion.

But Dr. Mustard does not use press of work as a reason for giving up the Editorship. The idea would not cross his mind that he is more beset than the next man. His resignation is the application of a principle in which he deeply believes—that those who have enjoyed the spotlight for a time must make way for the young, the eager, the courageous, who are crowding the wings waiting their turn on the stage. He was entirely serious when he publicly proclaimed in the September JOURNAL:

> " The Editor has a feeling that old names and old faces, including his own, have too long occupied strategic positions on boards and committees. . . . If someone wants to campaign for a candidate under forty for the Governing Council, the Executive Board, or Editorship of the JOURNAL, we shall joyously back his man (unless he has served a prison term of more than a year) against the fifty-and-over field."

Lest there be misunderstanding, it is important to state at this point that Dr. Mustard was born in 1888.

In telling each other what constitutes a good editor, as they have reviewed qualifications of possible candidates to succeed him, the members of the Editorial Board have been finding out what constitutes Harry Mustard. Instantaneous presence of mind is one of the ingredients—of a kind that picks up a remark on adolescents, for example, at a meeting, pays a pretty compliment to the speaker and turns the episode into grist for the editorial mill. The ability to recognize a stuffy idea a mile away and take a fall out of its proponent with finality and without offense, is another. Still another is the capacity to reflect upon observations and experiences, some of them dull enough in the acquiring, no doubt, and to relate them brilliantly to a present situation. Versatility is a *sine qua non* in an Editor of a magazine covering as broad a field as public health. Mark the range of Dr. Mustard's subjects and note how completely at ease he is in each; he has discovered their " essences " in George Santayana's use of the word.

No, the qualities that Dr. Mustard possesses and that make a good Editor for the JOURNAL are rarely associated with the young. Granted that one or another of his young people could bring to it his writing skill, what time or opportunity has such a person had to synthesize a philosophy from memories and experiences?

The Editorial Board is unanimous in its feeling that age is not a criterion to be unduly emphasized in the selection of an editor, but that what it must search for is someone having the vigor and fearlessness of youth, the experience and judgment of age, and the ageless genius for expression which the retiring editor possesses.

ORGANIZED LABOR, A NEW ALLY FOR PUBLIC HEALTH

MANY a community organizer has wished that organized labor would rally to the support of his cause with some spontaneity. If he has tried to bring in the unions he has probably experienced a more or less polite brush-off. Employee health has been a sore spot with the unions ever since management became

insistent about it and tried to use these methods as means to get rid of workers it did not like. For a long time health has been identified with coercion and repression from above. It has seldom had the benefit of wholehearted coöperation from labor itself because the workers themselves wanted health.

The tide appears now to have turned. Perhaps as a result of wider understanding by the public of the aims of health, or perhaps as a result of the organization by the great unions of committees concerned with the National War Fund, there has arisen from labor itself an organized desire to share actively in health promotion and to bring to the worker himself the obvious benefits of good health. A recent conference at the invitation of the American Public Health Association between the staffs of the CIO and of the A F of L committees on the National War Fund and the executives of national health agencies has pointed up this new attitude. No longer is labor being coerced in this area. Labor is aggressively seeking means of writing intelligent health clauses into its contracts and is trying actively to coöperate in the planning and operation of community health services. Very likely the influence of the central labor bodies will soon be felt in local union circles. It is a new movement with tremendous potentials.

Recent attention has been drawn to the action of the California State Federation of Labor where examinations for syphilis have been endorsed and recommended to local unions. In this case the initiative came from a voluntary group, the California Social Hygiene Association, which found a responsive and intelligent labor leadership. From this beginning has come a request from labor itself for the inclusion of routine chest x-rays for the protection of the worker and his associates. This represents a fresh aspect of the search for unrecognized tuberculosis and one that will be welcome to those whose business it is to advocate these examinations. It would not be surprising for this demand to spread from union to union until it may tax the ability of the official and the voluntary agencies to supply service. It may forecast a useful peacetime disposition of the x-ray equipment now so widely used by the military forces. It suggests also a fruitful direction in which the unprecedented income from the Christmas Seal Sale may be used. Of course, such case finding is only the first step and the resulting demands for service from nursing and other staffs will not make simpler the present difficult job of the administrator. Even so, it may be the opening door to significant achievements, including practical use of the routine physical examination. What if the demand for this procedure should now come strongly from the people themselves?

All the foregoing gives point to the volume recently published under the auspices of the National Tuberculosis Association on labor relations. The time has come to do away with the amateurish activity which has been typical of health workers in the past and to make our contacts with the unions and with management in conformity with approved methods. This manual, under the title of "Tuberculosis: Labor and Management" is prepared for the workers engaged in local tuberculosis service who need a quick bird's-eye view of present industrial relations. Although focused on tuberculosis, it opens up in a practical way the matter of industrial relations, and can profitably be read by all public health workers, both official and voluntary.

"This brief manual is not a cook book. It contains no fool-proof recipes furnishing the final answer to all problems of human relations arising from the impact of a complex disease, tuberculosis, upon a complex structure, modern industry. Let it be said, once and for all, there is no royal road, no easy short

cut, which will relieve man from the often unpleasant task of thinking things through."

The leadership which the National Tuberculosis Association has shown in this field of industrial hygiene is indeed commendable. The success of this initial monograph in the series planned by the Association will make its readers receptive to the subsequent manuals on Mass Radiography in Industry and on Viewpoints of Management and Labor as they appear.

Credit Lines

SO many requests have come to the Association for the address which Professor C.-E. A. Winslow of Yale University presented at the luncheon session held at the Annual Meeting of the American Public Health Association in New York, October 14, 1943, that it is reprinted herewith.

Greeting to Latin American Guests at the A.P.H.A. Meeting.

It is a very great pleasure to welcome the representatives of our sister republics to the south. Many of them have been our guests before, and have become dear and valued friends. Never before, however, have we had the advantage of such a galaxy of knowledge and vision in the field of public health. We look forward to a very great stimulus of our common activity in this country through what we shall learn from our distinguished visitors.

There are many ties that bind us together. North of the Rio Grande we recall what Washington and Lincoln have done in the timeless war against tyranny; but we are equally proud of the great liberators of the south, of Bolivar and Sucre, San Martin and O'Higgins. We may boast of Theobald Smith and Walter Reed; but we share your admiration for Oswaldo Cruz, for Chagas, for Finlay and Carrion. Cuba and the United States together fought yellow fever at Havana. Gorgas triumphed at Panama; and the recent triumphs of Barreto in Brazil in his victory over the gambiae mosquito have been glorious enough to justify pride in both hemispheres.

In the newer social fields of public health we in the United States can hardly claim to be comrades, but rather followers. Certain of your Latin American countries pioneered in the enforcement of the eight hour day, and in the provision of other forms of labor legislation long before we followed in the north. The social security system of Chile is a model for the world; and we look with admiration at such enterprises as the rural school health centers in Mexico.

It is a common thing for a representative of one nation to attempt to compliment another by an emphasis on their likeness. It is not, however, a real compliment to say "We feel you are just like one of us." The essence of true internationalism is not a sea of uniformity but a complementing by various peculiar national characteristics of a whole that is more than the sum of its parts. Aquinas said that "Beauty is unity in variety"; and this is the real keynote of international relations.

You have many things we do not have, many peculiar and special contributions to the stream of world civilization. For example, the culture of many Latin American countries represents our only link with the ancient civilizations of these continents before the coming of Columbus, a link with the great primitive people who developed the Maya calendar long before the Gregorian calendar was in existence, and with the Incas of Peru who planned and executed an extraordinary program of national social security.

Then too you bring into the comity of nations those traditions and those qualities which made the period of the Conquistadores so glorious. In 1620 my ancestors were huddled in primitive wooden huts on the shores of Plymouth, but nearly a hundred years before (in

1532) the first printing press on this continent had been set up in México. My own university (Yale) is the third oldest in the United States, being founded in 1702; but a century and a half before this (in 1551) Mexico City and Lima had established their own great universities.

To the genius of Latin America we owe Orozco and Rivera, who stand in the very forefront of the world of art; Dario of Nicaragua in poetry, Rodo, the essayist of Uruguay, and Marti, the great philosopher of Cuba.

We think of ourselves in the United States as individualists, but the culture of Latin America has given a deeper and richer interpretation to the development of individual character and personality and to the evolution of all those qualities which make for the graciousness of life.

We face today the most critical challenge that has ever confronted the human race. The close of this war will demand almost superhuman efforts if our world is not to sink into the darkness of chaos. The hope is that by each free nation making its special contribution, displaying its special genius, all these contributions may be welded together into a great common effort to the end of the building of a world nearer to the heart's desire than any that has yet been known.

THE CARE OF COMMUNICABLE DISEASES IN GENERAL HOSPITALS

James E. Perkins, M.D., Director of the Division of Communicable Disease Control in the New York State Department of Health, Albany, has recently summarized the attitude of his department on the care of communicable diseases in general hospitals. The following is quoted from the January 17 issue of *Health News:*

In the early part of this century, there was a tendency on the part of municipalities to build special hospitals for the isolation of communicable diseases. These so-called "pest houses" were designed particularly for the care of smallpox cases but were intended for the isolation of other acute infectious diseases as well. At that time, it was thought feasible to control communicable diseases in communities through isolation of recognized cases since it was felt that if all patients were isolated until they were no longer infectious, the spread of these diseases would cease. However, upon further investigation from a bacteriological standpoint, it was learned that in many communicable diseases, symptomless carriers and atypical cases which ordinarily would not be recognized as infectious are frequently more important in the spread of the disease in the community than the typical cases which can be detected. The routine hospitalization of acute communicable diseases for the sole purpose of limiting spread of the infection in the community, therefore, obviously would not accomplish this objective.

At present, hospitalization of contagious diseases ordinarily is recommended only in those cases requiring care from the standpoint of the welfare of the patient himself and which can be given only in a hospital and not at home. In rare circumstances, it may still be necessary to hospitalize patients from the standpoint of the protection of the community as, for example, in the case of a communicable disease discovered in a transient or occurring in a home in which for certain reasons proper isolation is impossible.

Concomitant with the development of our bacteriological knowledge of communicable diseases, techniques have been devised to permit the safe isolation of cases of communicable diseases in general hospitals. These procedures vary with the disease: some patients can be cared for without danger on a ward; others must be confined to a private room. However, there is essentially no communicable disease which can not be cared for safely in a private room on a floor on which there are other patients with noncommunicable diseases, providing certain techniques are practiced rigidly by the attendants. It has become increasingly clear that the training and skill of the attendants are much more important in controlling the spread of infection than the physical equipment provided.

In the opinion of the New York State Department of Health, therefore, separate buildings for the sole care of communicable diseases are not essential. In larger municipalities it may be more convenient for a hospital to have a separate building for this purpose, but this is a matter of convenience

and not necessity. In smaller places in which such a building would be vacant a large part of the time, an unnecessary expense to the community would be entailed.

Every hospital is dealing with communicable diseases whether or not it recognizes that fact. Because of the prevalence of carriers and atypical cases among the general population, it is inevitable that such carriers and cases will be admitted from time to time to a hospital even though the infection is not detected at the time of admission. The routine procedures followed in these hospitals, therefore, with regard to the hygienic practices of the attendants, the handling of food and dishes, and the use of various types of equipment (such as thermometers, enema apparatus, etc.) should be such that there is no likelihood of the transfer of secretions or excretions from one patient to another. If such techniques are not followed, sooner or later an outbreak is bound to occur through the introduction of pathogenic microörganisms by a carrier or atypical case.

FOOD HANDLERS SCHOOLS

The Food Division of the Memphis and Shelby County Health Department, Memphis, Tenn., organized a Food Handlers School which ran for 8 days recently under the joint sponsorship of the Memphis Restaurant Association and the Health Committee of the Memphis Chamber of Commerce. The School was conducted by personnel from the U. S. Public Health Service, assisted by the local city and county health department.

According to Marvin F. Carter, the Director of Health Education in the Memphis and Shelby County Health Department, the 12 sessions, representing 3 lessons, brought out a total attendance of 4,433 persons, representing fully 25 per cent of all food handlers in Memphis. According to Mr. Carter, there was excellent coöperation from the Restaurant Association, the Chamber of Commerce, the newspapers, and radio stations. Classes consisted of talks, demonstrations, motion pictures on bacteriology, food poisoning, communicable diseases, proper washing of dishes and glassware, and other means such as single service containers to take care of rush hours when it is difficult to get dishes and glassware properly washed. Coöperating on the faculty were Major Male, Dr. Butterworth, and H. C. Taylor from the New Orleans office of the U. S. Public Health Service.

A certificate testifying to the attendance from a restaurant was issued by the county and city health department when more than 75 per cent of the food handling staff completed the course. In addition, small cards certifying to an individual's attendance were distributed. The percentage of persons in attendance marks this as a unique project. According to Homer N. Calver of the Public Health Committee of the Cup and Container Institute, similar schools are planned and under way in a number of cities.

RELATIONSHIP BETWEEN THE MEDICAL PROFESSION AND GOVERNMENT

In an address before the Westchester County Medical Society, White Plains, N. Y., January 18, 1944, Dr. Edward S. Rogers, Assistant Commissioner for Medical Administration, Bureau of Pneumonia Control, New York State Department of Health, Albany, N. Y., expressed a philosophy with regard to the practising physician, society, and government, which is worth pondering. This section of his address is printed by permission of the *Bulletin* of the Westchester County Medical Society. The full text is carried in the *Bulletin* for February.

I should like to start with two premises upon which, it seems to me, there can be no disagreement: First, that we, as a profession, are committed to the cause of progress, progress in the science of medicine and in the problem of its application to society. Second, that we are equally committed to a program of realistic growth in the belief that the two extremes, that of reactionism born of fear of change and of revolution born of avarice, are costly and undesirable in comparison to rational, well conceived and soundly guided growth by evolution.

If you will measure the present times by these standards, I believe you will agree with me that the fact of progress is inevitable, but that the method of progress is still a matter of choice. I am firmly of the conviction that regimentation is unnecessary and equally convinced that reactionism is pure folly because it cannot and should not overcome the stronger current of social growth, but by deviating attention from the realistic approach will only serve to leave the stronger current without effective control.

At this point, therefore, I should like to add a third premise—namely, that since progress and change in the application of medical care to society are not only inevitable but also desirable, this fact should be recognized by the profession. To this end, the medical profession should select or create, and give its support to, a class of physicians who are competent to devise and guide such growth. I further believe that it is a specialty in its own right, demanding men of particular qualification and background and that the specialty may well be called administrative medicine.

Do not confuse this with leadership. Medical leadership is the prerogative of no group or specialty, but belongs to those who rise in any branch of the profession to deserve it; but leadership is not synonomous with administration and organization in a functional sense; and these are what I am talking about.

Administrative medicine, in the sense that I am using the term, embraces several broad areas of activity. The medical administrator's first responsibility is the facilitation of the application of medical science to society. To do this, he must have a broad enough acquaintance with medical science to evaluate what is good and what is not, and to whom to turn for technical advice; and he must also have a broad enough knowledge of society to know what its problems are and to know the good from the bad in the manner of answering these problems.

He must be able to recognize the interests of the medical profession, not only in serving society, but also in self-preservation—an honorable prerogative of any worthy group. And he must also be able to understand and evaluate the interests of society. Where these interests coincide, he should bring them together. Where they are in apparent conflict, he should reconcile them. Where they are in absolute conflict, he should guide them through periods of adjustment on both sides, avoiding injustices, and above all having wit enough not to destroy the basic rights of any group.

What good, for example would come out of the regulation of medicine under some superimposed and theoretical system if, by so doing, the profession were to be made unattractive to men of the best professional calibre? Rather better, it seems to me, would be the process of enabling the medical profession to regulate itself within the broad concepts of our social growth.

The medical administrator must therefore know his profession and the leaders in it, if he is to serve it well.

As I have said, responsibility in leadership should not be confused with responsibility for operation. Our Congress and the President may be said to be in positions of leadership with respect to the war, but they do not, or should not, presume to direct the technical phases of our prosecution of the war. They should leave that to those who are equipped and in the position for such direct responsibility.

Similarly, I believe that medicine, through the voice of its organized bodies and outstanding leaders, should determine or pass upon the broad objectives of its growth, but the technical, complex and delicate task of actually directing such growth is not a part-time task for an untrained man. Nor does the structure of organized medicine provide the complete machinery for such administration.

Let us take a look at government, not perhaps as we may see it now, but rather as it should be. It seems to me that government should be the agency of the people whereby they provide themselves with the machinery for self-regulation in the best interests of all. The pressure groups that menace us today should have no power to go beyond making their just views and needs known.

If we will accept this definition of government, we may next explore the application of it to certain broad segments of society. The medical profession is, by its very nature, a service group to society and, as such, cannot escape being an important element in any system of government that society may conceive. Here, however, comes a fine point that is perhaps the crux of the matter. It is entirely sound for society to make certain demands upon the medical profession and to make its needs known. But, as a mass, society knows nothing about medicine, nor does it possess any skills whatsoever beyond those of the individuals and groups of which it is comprised. As a mass, it has neither the knowledge nor other means whereby to feed itself, or to minister to its own ailments or to direct its own growth with intelligence.

Yet, in a democracy, society possesses great

power and its wise direction becomes imperative. Since authority for such direction must be vested in individuals, there is always the danger that these individuals will bring to their office, or acquire in office, views that are conditioned or otherwise prejudiced with respect to the groups that actually constitute society.

It would seem to be desirable procedure for society, when it feels the need of medical care, to call the doctor. But, equally, it would seem to be desirable for the doctor, when he is called, to respond. Thus, there is a twofold responsibility of which, in our recent history at least, I am not too sure that either society or the doctor have met their share.

Clearly, this problem is one which both society and the medical profession might well resolve through the use of properly operating government. Yet, to do this, the medical profession first must recognize the specialty of administrative medicine and it should select and place its own trained and qualified men in the offices of government that will operate in its own control. And in turn society, in the broad sense that I am using the term, must acknowledge the importance and the propriety of such an arrangement.

Bear in mind, though, that I am not recommending the uncontrolled self-determination by the medical profession of the rôle of the medical profession as a part of society. Rather, I am recommending the integrated control of medical care through a system whereby the medical profession will be the principal and primary source for the origin and development of such measures as may be indicated. Coördination and adjustment of what the medical profession recommends with the needs and recommendations of other groups must be accomplished also within the structure of government, at a higher level.

Were the medical profession to pursue the policy of complete self-determination, it would achieve all of the faults of what I have previously referred to as a pressure group, where selfish interests are likely to dominate. To justify such a policy in relation to any single profession or occupational group would certainly imply an equal right for all other professions or occupational groups. It would be tantamount to claiming that the farmer should determine his own place in society without any integration or control, or that labor should do likewise—obviously impossible procedures if chaos is to be avoided.

These views I urge upon you as being more than idle fancy upon my part. I believe that they strike close to the heart of the problem that now acutely confronts us. Specifically, the starting point is this: We need to think of the structure of things for the time we all await when the war is over. We need to have our plane for coördinated action well developed. We need not only to have the men to lead us, but also the men to carry on the complex job of designing and building our medical future and we need to have those men in positions of responsibility where they can work most effectively.

The medical profession frowns upon certain forms of practice as unethical, yet licensed physicians continue to so practice. The medical profession frowns upon "government intervention," but such frowning is not very likely to stop the government from meeting a popular demand for a medical care program. When the government starts such a program, who is going to devise it?

When the government wants physicians it will find them. I hope that they will be the right men, that they will be part of, and understand the practising medical profession; that they will be realists and not theorists in their approach. I hope also that the medical profession, by a forward looking attitude, will see to it that this becomes increasingly possible and that the physicians selecting or selected for the field of administrative medicine are chosen wisely and given the opportunities to work with, and the support of, the profession that the seriousness of their undertaking deserves.

. . . .

To summarize: It seems clear that the time has come when the medical profession must move more realistically toward the construction of its place in a rapidly changing social structure. To do this, it should recognize the place and need for trained physicians in the administration of its own growth, and it should develop and utilize the forces of government in the belief that good government should serve the people.

LABOR AND HEALTH AND WELFARE ACTIVITIES

The Community Chests and Councils, Inc., 155 East 44th Street, New York 17, N. Y., has done a commendable job in indicating by implication in the title of a recent study that labor may be interested in portions of the programs of health and welfare agencies other than their financing. Replies from 105 cities to an invitation issued by Community Chests and Councils to its

member councils of social agencies and community chests to tell the story of their relations with labor, excluding fund raising matters, are summarized in a pamphlet entitled "Labor Participation in Organized Health and Welfare Activities Other Than Fund Raising." Price *25 cents*. The record of the cities thus far, as reported, will hardly occasion dancing in the streets, but even to discuss the mechanics of securing labor coöperation is an encouraging sign. An interesting comment in the summary is to the effect that letters from several cities expressed the opinion that there was current "over-emphasis" on the whole question of labor participation—a conclusion probably warranted in some communities and wholly unwarranted in others where efforts in this direction have been feeble or not made at all.

THE EVALUATION SCHEDULE AND POST-WAR PLANNING

At present writing it is anticipated that several hundred counties and cities in the United States and Canada will submit *Evaluation Schedules* giving a record of practices and facilities for the protection of public health for the year 1943. The *Schedules* are to be forwarded to the American Public Health Association office by March 1. Some *Schedules* will be sent directly, others through the state department of health.

In these hopeful times with increasing confidence in the approaching victory of the combined forces of the United Nations on the world's battlefields, eyes are being focused already on planning for the future. A ready-made plan that can serve as the basis for charting the future in the field of public health is to be found in the pages of the *Evaluation Schedule* and the chart which is returned to the community following the grading of the *Schedule*. On this chart is visualized clearly the strong points in a local health program as well as the weaknesses and inadequacies. No better start can be made toward public health advancement than through thorough study and discussion of the "red" marks on the grading chart. Here are the clues to the unmet needs.

In some communities there will be shortcomings to be strengthened in the control of syphilis. In others lack of beds for tuberculosis cases is the major need. But whatever or wherever the weak spot, the picture is there portrayed for all to see.

The first step in planning ahead is a knowledge of what is today. The inventory process made possible by community use of the *Evaluation Schedule* provides the makings of the necessary topographical map on which to plot the roads and the buildings and the practices which will lead to better health for more people in the immediate future.

WHAT ARE HEALTH DEPARTMENTS DOING ABOUT ACCIDENT PREVENTION?

This question is partially answered by the Subcommittee on Accident Prevention of the American Public Health Association, Donald B. Armstrong, M.D., *Chairman*, in *The Spotlight* for January.

The committee calls attention to activities in New York, Minnesota, New Jersey, Illinois, and Kansas, which have emerged thus far in the review it is now conducting of state patterns of organized home and farm safety programs. The full report of the committee will be awaited with interest.

It should be mentioned that *The Spotlight* is an informal newspaper published in the interests of the National Health Honor Roll by the Committee on Administrative Practice. Its circulation is limited to health officers, but copies of the January issue may be obtained on request to the Association at 1790 Broadway, New York 19, N. Y.

BOOKS AND REPORTS

All reviews are prepared on invitation. Unsolicited reviews cannot be accepted.

The Principles and Practice of Industrial Medicine—*Edited by Fred J. Wampler, M.D. Baltimore: Williams & Wilkins,* 1943. 555 pp. Price, $6.00.

This interesting and valuable contribution covers the important aspects of the whole field of industrial medicine in 33 chapters prepared by somewhat less than this number of specialists in the field.

Beginning with a very brief history of the subject, the volume includes such subjects as Appraisal and Control of Industrial Health Hazards, Accidents, the Medical Department and Medical and Nursing Services, the Industrial Health Program of the American Medical Association, the Effects of Temperature and Abnormal Pressure, Lighting and Vision, Fatigue, Toxic Compounds and the Medical Control of Such Industrial Exposures, Electricity, Occupational Diseases of the Skin and of the Lungs, Venereal Diseases and Their Control, Nutrition, Shock and Burns, Compensation, Rehabilitation, and Women in Industry.

It must be obvious to the reader that a volume presenting such an over-all picture of the problem of industrial medicine should be very valuable and that is true in the present case; in fact, this book is to be highly recommended to those who desire just such an over-all statement of the various aspects of the now large field of industrial medicine.

When one examines the content of some sections of the book in detail, it becomes apparent that certain of the authors must lack close industrial contact with the field about which they have written. For example, the section on " The Toxicity of Certain Organic Solvents in Industry " deals with relatively few of the important solvents, and omits much information of basic importance.

One chapter is devoted to the pneumonoconioses and of this all but one and one-half pages are devoted to silicosis. The remaining page and a half are devoted to asbestosis, siderosis, and anthracosis. This is hardly a sufficient treatment of a subject very important to the industrial physician. Occupational poisonings of various kinds are presented by eight different authors in seven separate sections of the book. Under these conditions, it is difficult to present a subject without some repetition and certain important omissions.

These criticisms must not be given too much weight, however, for the book as a whole is a valuable compilation for the industrial physician and other workers interested in this important branch of public health. The format, typography, figures and photographs are of a high standard.

LEONARD GREENBURG

The Nature and Treatment of Mental Disorders—*By Dom Thomas Verner Moore, O.S.B., Ph.D., M.D. New York: Grune & Stratton,* 1943. 312 pp. Price, $4.00.

This book is presented by the author to clarify the field of psychopathology for physicians, psychiatric social workers, and psychiatric nurses. It is divided into four parts dealing with " Psychopathology, Therapy of Psychological Analysis, Miscellaneous Techniques and Organic Emotional Disorders." At the end is an appendix giving " Classification and Definition of the Clinical Entities of Psychiatry."

The latter is based on the *Statistical Manual for the Use of Hospitals for Mental Diseases* published for the National Committee for Mental Hygiene, 1942, and edited by Dr. Clarence O. Cheney. In this book Father Moore has made a worthy effort to summarize a vast field of psychological and psychiatric theory, and has accompanied this summary with case material illustrating his use of theories in practical work with individual cases. The author is frank to utilize what he can of theories that these fields present. The reader is at liberty to go further if he wishes, but he is not encouraged toward a goal of therapy that is more than he can take in the face of his common sense and individual experience.

ESTHER L. RICHARDS

The Nutrition Front: *Report of the New York State Joint Legislative Committee on Nutrition; Legislative Document No. 64,* 1943. 286 pp.

There is much information on current phases of nutrition in this report, and the committee responsible for it has done a good job in stirring up interest in improved nutrition. The recommendations of the committee regarding support of nutrition, school lunches, etc., are excellent, and it is hoped they will be carried out. Unfortunately, the report is cluttered up with much misinformation in the form of "opinions" by "authorities" on subjects such as: "hidden hunger"; draftees rejected because of nutritional deficiencies; vitamin supplements to workers ("In one plant in particular I saw it (vitamin supplements) increase in six weeks the amount of production, the reduction of spoilage and accidents, the reduction of absenteeism, and the increase of the weekly wage; results . . . statistically significant"); "vitamin C . . . assists in the resistance of the body to nitro-amido poisonings . . . it stimulates the circulation of the blood . . . we personally have never run any controls for observation in regard to the benefits from these vitamin C tablets." How true! This report is recommended only to those who can distinguish fact from fancy, though it will be of interest to all.

FREDRICK J. STARE

Careers in Public Health—*By Adrian G. Gould; M.D. Chicago: Science Research Associates* (1700 Prairie Avenue), 1943. 49 pp. Price, $.60.

Those who are concerned with the preparation of young persons for careers in the field of public health will be glad to know that a serious attempt has been made through this publication to cover the subject from the standpoint of vocational guidance adapted for high school and college students. Most vocational and professional areas are better documented than public health has been, and the author is to be commended for this effort. It is not easy to write a comprehensive monograph which will orient a young person on the historical development of careers in public health and which will distribute the emphasis properly. There will be minor criticisms as to details in this presentation, but for the intended purpose of giving a young person an over-all view of the field it is to be commended. The manuscript is well linked with the reports available from the Committee on Professional Education of the A.P.H.A. and with similar reports from other professional societies. REGINALD M. ATWATER

Municipal and Rural Sanitation—*By Victor M. Ehlers, C.E., and Ernest W. Steel, C.E. (3rd ed.) New York: McGraw-Hill,* 1943. 449 pp. Price, $4.00.

This book is a condensed reference work on the various aspects of environmental sanitation as applied to

municipal and rural areas. It is a useful volume for the sanitarian and others engaged in the application of public health preventive measures to civilian life.

This 3rd edition is marked by substantial additions and revisions in keeping with current practice in the sanitation field. The discussion on pasteurization in the chapter on milk sanitation has been expanded to include modern methods and controls. The chapter on food sanitation has been revised to give more adequate coverage to the inspection of food handling establishments. More recent and more complete information is given on the bactericidal treatment of utensils and equipment. Additional information is furnished on the classification of waters in which shellfish are grown. A description of the modern practice of sanitary land filling for garbage and refuse disposal has been added to the chapter on that subject. Additional data on incinerator design and operation are also furnished.

Recognition is taken of the rapid developments in the field of commercial air conditioning by the addition of this subject to the discussion on ventilation. Other topics covered in this book include insect and rodent control, plumbing, lighting, housing, industrial hygiene, the sanitation of schools and swimming pools, and miscellaneous other sanitary controls involved in the transmission or prevention of communicable disease and the promotion of social health and well-being.

It is unfortunate that the chapter on the general characteristics of water does not include the Public Health Service drinking water standards adopted in 1942. In the discussion on fluorine in water no cognizance is taken of the possibilities of the reduction in dental caries by the maintenance of a small fluorine content in the public water supplies. In the chapter on water-carried sewage disposal there may well be a difference of opinion in some sections of the country as to whether cesspools customarily should be "dug deep enough to penetrate into ground water." It is believed that the discussion of cesspools could, to advantage, be amplified.

The book has been interspersed with more usable figures and data than previous editions. It is recommended as an excellent text for the student of sanitation and the practical worker in the field. ALBERT H. STEVENSON

Relaxation—*By Josephine L. Rathbone. New York: Bureau of Publications, Teachers College, Columbia University,* 1943. 157 pp. Price, $1.75.

Miss Rathbone has written a popular treatise on the causes of tension and some of the way for relieving it. A secondary purpose has been to rally education to the assistance of medicine, for the author emphasizes that no one type of remedy will remove all of the causes of tension.

The first part of the book is devoted to a discussion of the relation of fatigue to tension, and of the physical and psychological causes of fatigue and their symptoms. The presentation of certain topics is worth particular mention. The integrated nature of the human organism, the appraising of health accounts, the description of causes of chronic fatigue, the value of goals which men set for themselves are topics which have been treated clearly for the popular reader. Certain discussions of the physiology of fatigue are likely to mean very little to most persons. Description of the chemcial changes in a muscle during contraction is too technical and serves little purpose in this book.

Physical and psychological treatments for chronic fatigue, hence for the relief of tensions, are described in the second

half of the book. Full reference is made to the technic of producing relaxation as used by Dr. Edmund Jacobson. One may experience difficulty occasionally in following the discussion on treatments because of the author's excursions too deeply into marginal areas. The recommendations for attitudes towards play in adult life are sound.

One may conclude that relief of chronic fatigue may result from securing adequate rest and avoiding excessive activity of any type, and in many cases doing suitable muscular exercise. It is emphasized that these do not supplant the need for medical advice and service where such are indicated.

The book, especially the first part, is very readable and should prove useful to persons who are interested in the causes of tensions and some of the ways for relieving them.

GLENN W. HOWARD

Holt's Care and Feeding of Children—*By L. Emmett Holt (16th ed.) New York: Appleton-Century,* 1943. 321 pp. Price, $2.00.

During the early days of the Babies Hospital in New York, according to the interesting biography of Dr. L. Emmett Holt by his son, Dr. L. Emmett Holt, Jr., and R. L. Duffus, one development of considerable novelty was the organization of a short training course for nursery-maids. Dr. Holt, the hospital's attending physician, took charge of this teaching and for one of his teaching materials prepared a "Catechism for Nurses" to cover the commonly met details of clothing, bathing, feeding, etc. The "Catechism," issued by the hospital in the form of a 4 page pamphlet containing 23 questions and answers, was taken into the community by the nurses as they graduated and soon became generally known. Demand for reprints reached such proportions that general publication became inevitable and the pamphlet was expanded to a booklet of 66 pages, published under its present title in 1894. Seventy-five reprintings and translations into Spanish, Russian, and Chinese testify to the early need and continuing popularity of this book.

The present edition, the 16th, has been revised and enlarged by Dr. L. Emmett Holt, Jr., Associate Professor of Pediatrics, the Johns Hopkins School of Medicine. The book retains its question and answer form and touches on most of the subjects likely to interest those caring for children. In general, the advice given is simple and practical, although there are curious lapses. Not many mothers will want to take time to iron diapers nor are many likely to give up the advantages of tie shirts for those which "button down the front."

The book's most striking deviation from present-day trends, however, is in the field of habit training and guidance in general. Although some liberalization is evident, there are still heavy overtones of the rigidity which is now fortunately on the wane in most pediatric practice.

In an era which has witnessed great expansion in available medical services for well and sick infants, one wonders at the necessity for including quite so much material on diagnosis and treatment.

MYRON E. WEGMAN

Principles and Practice of Rehabilitation—*By John Eisele Davis, Sc.D. New York: Barnes,* 1943. 211 pp. Price, $3.00.

The purpose of this book is to present the principles and practices of rehabilitation which have been found most successful with patients having neurotic and psychotic conditions. The author points out the need for a program of rehabilitation for the increasing number of individuals who are being sent to mental hospitals. He constructs the edifice of rehabilitation by using as building blocks the individual's wants,

interests, needs, and capacity. It is a usable psychology of practical rehabilitation, for it presents the syndrome of each mental disease and then outlines the types of recreational and occupational therapy most suitable to meet the needs of each condition. An important principle which is stressed is that of distinguishing " between those activities that do something to the patient and those activities that cause the patient to do something himself, for himself."

This book is highly recommended to physical, occupational and recreational therapists, educators, psychologists, and psychiatrists interested in the rehabilitation of those emotionally disturbed.

GEORGE G. DEAVER

Food Poisoning—Its Nature, History and Causation. Measures for Its Prevention and Control—*By Elliot B. Dewberry. Foreword by Gerald R. Leighton, M.D. London: Leonard Hill Limited (17 Stratford Place, W. 1). Ill. with 30 figs.*, 1943. 186 pp. Price, $3.75.

This compact volume is a valuable contribution to the subject of food poisoning. It is written in three parts, the first dealing with bacterial food poisoning; the second, with poisons (metallic, poisonous plants, poisonous fish and shellfish) and with food allergy. The third part discusses botulism. Two appendices deal respectively with the contamination and decontamination of foods by poisonous gases in war, and with the steps to be taken by medical officers in rural areas in suspected cases of food poisoning.

The section on war gases is timely and includes a two page table showing the grouping of the poisons as " irritant," " blistering," etc., the name of the gases, their effect on various foods, and the decontamination treatment of these affected foods. The first and third parts are introduced by a ten page " historical " sketch, while tucked away in the text are many historical briefs or citations of illustrative incidents. These will interest all participants in public health educational endeavors.

We have been favored in 1943 with contemporaneous British and American publications titled " Food Poisoning." The reading of both books emphasizes the importance placed on staphylococcus food poisoning in the United States as compared to the light consideration of this subject in the Dewberry text. In the United States publication, 32 pages are devoted to a separate chapter captioned " Staphylococcus Food Poisoning." In the Dewberry text, only 3 pages are allotted to this subject. Two of these 3 pages are devoted to a discussion of nine cases which occurred in Leicester during 1942. This outbreak " was at once traced " to an American food product.

Dewberry discusses Salmonella, botulism, poisonous plants, poisonous fish, poisonous shellfish and poisonous metals in a detailed and interesting manner.

Chapter VII is devoted to the prevention and control of bacterial food poisoning and includes a sub-heading entitled " Paper Containers for Milk." This cites the New York State Agricultural Experiment Station recommendations concerning the production and handling of these to prevent " infection of milk."

Chapter XIX pertains to the prevention of botulism. In this section, the author emphasizes the need for adequate equipment to obtain the high temperatures such as are produced in steam pressure cookers. He closes the section on home canning and preservation by quoting a 1934 communication from Dr. K. F. Meyer: " If there is no pressure cooker available in home preserving of non-acid foods it is safer to substitute dehydration, salting or pickling for canning."

A short chapter on food allergy is of

interest. Many pertinent references appear supplemental to the chapters. These are combined into an "Author Index" preceding the "Subject Index."

The casual consideration of Staphylococci weakens this book as a complete reference text on this subject. However, the book does contain so much that is of interest and of value as to occasion the opinion that it is a desirable complementary adjunct to other texts on food poisoning.

R. V. STONE

Fundamentals of Nutrition and Dietetics: A Workbook—*By Alberta Dent. (2nd ed.) New York: Wiley,* 1943. 209 pp. Price, $2.00.

Except for the words "a workbook," the title of this book is misleading. It is simply an "exercise book" to accompany an elementary course in home economic nutrition. If such a book is desired, this one will probably serve as well as any other except that it is printed in type that is too small for comfortable reading. There is nothing unusual or new about this book, and the reviewer is of the opinion that it is entirely too much on the side of "spoon feeding" for students of college grade.

FREDRICK J. STARE

Hospital Discharge Study—Hospitalized Illness in New York City *(Vol. II)—By Neva R. Deardorff, Ph.D., and Marta Fraenkel, M.D. New York: Welfare Council of New York City,* 1943. 349 pp. (Offset.) Price, $1.00.

The second volume of this study analyzing the hospital care of more than half a million New Yorkers in 1933 is now completed. The first volume dealt with the patients, their ages, residence, diseases, conditions on discharge. In the second volume the emphasis is upon medical conditions and hospital care—the types and auspices of hospitals and the types of diseases cared for in them.

The third volume, still in preparation, will summarize the experience of the project in suggesting practicable methods of hospital morbidity reporting as a routine procedure. The three volumes with their separate emphases lay the groundwork for a meaningful system of hospital morbidity reporting. The entire study is a monument to the imagination and tenacity of purpose of those who fashioned a significant addition to social accounting out of the otherwise unemployed talent salvaged and developed by the Work Projects Administration.

MARTHA LUGINBUHL

Tuberculosis in the United States—Graphic Presentation, Vol. I—*New York: Medical Research Committee, National Tuberculosis Association,* 1943.

This publication presents in tabular and graphic form information concerning tuberculosis mortality for the United States as a whole, for each state, and for certain geographic divisions. The 3 year periods covered are 1919–1921, 1929–1931, and 1939–1941. The information is presented by age, sex, and color, three of the main factors associated with variations in the tuberculosis mortality. The tables and graphs are well arranged, clearly printed, and therefore easy to follow and use. The volume is to be highly recommended as a source of information. The wealth of material contained does not lend itself to review and can only be adequately appreciated by consulting the publication itself.

GAIUS E. HARMON

Elements of Medical Mycology—*By Jacob H. Swartz, M.D. New York: Grune & Stratton,* 1943. 179 pp. Price, $4.50.

Anyone who has struggled with the identification of fungi will at once appreciate the practical approach of the

author and the excellent classification methods made available for diagnostic purposes. The illustrations and charts are commendable. The author, who is Assistant Professor of Dermatology at the Harvard Medical School, has balanced the diagnostic and treatment features in a manner which utilizes his own first hand experience and should be valuable to students and others seeking a comprehensive grasp of medical mycology. The volume is well documented from the literature from this country and abroad. Given such contributions as this work, the field of mycology in time may become as well understood as medical bacteriology.

REGINALD M. ATWATER

The Science of Nutrition—*By Henry C. Sherman. New York: Columbia University Press,* 1943. 253 pp. Price, $2.75.

The Science of Nutrition is the latest of a series of distinguished monographs by Professor Sherman.

The author says in his preface that he has sought to summarize and evaluate " the present status of nutrition in as concise and impersonal a manner as possible." He has succeeded admirably in his purpose. This short book is unusual in giving both a careful presentation of the accepted facts of nutrition, and an extensive discussion of the place of the science of nutrition in our society. About half of the chapters are devoted to the subject matter of nutrition, with considerable emphasis on the historical development and changing attitudes in the field of nutrition. " Technical terms are reduced to a minimum."

The second half of the book is largely spent in a discussion of the nutritional status of the nation, what the government can reasonably do to improve nutrition in the United States, and what rewards are likely to result from such improvement. The author argues most seriously and convincingly that only heredity and bacterial diseases are as important factors as nutrition in deciding the health, vigor, and longevity of man.

To document his conclusions that great benefits will be derived from an improvement in the nutrition of the nation, Professor Sherman draws extensively on experiments carried out with rats in his laboratory at Columbia University. He presents convincing evidence that a wide gap exists between the diet that is just adequate to prevent signs of frank deficiency and one that produces optimum nutrition.

On the whole this book lies somewhere between the nutrition textbook and the popularized account of the more superficial aspects of nutrition. By filling the gap between these two extremes it should attract readers from all branches of biology who are interested in recent advances in nutrition.

OLIVER H. LOWRY

BOOKS RECEIVED

HEALTH AND HYGIENE. By Lloyd Ackerman. Lancaster: Jacques Cattell Press, 1943. 895 pp. Price, $5.00.

A GUIDE TO PRACTICAL NUTRITION. By Michael G. Wohl, M.D., and John H. Willard, M. D. Philadelphia: Philadelphia County Medical Society, 1943. 98 pp.

APPLIED DIETETICS. The Planning and Teaching of Normal and Therapeutic Diets. 2nd ed. By Frances Stern. Baltimore: Williams & Wilkins, 1943. 265 pp. Price, $4.00.

THIS MILK BUSINESS. A Study from 1895 to 1943. By Arthur Guy Enock. London: H. K. Lewis & Co., Ltd., 1943. 243 pp. Price, $4.75.

THE MARCH OF MEDICINE. Number VIII of the New York Academy of Medicine Lectures to the Laity. New York: Columbia University Press, 1943. 151 pp. Price, $2.00.

THE CURRICULUM IN HEALTH AND PHYSICAL EDUCATION. By Leslie W. Irwin. St. Louis: Mosby, 1944. 391 pp. Price, $3.50.

CHILDBIRTH WITHOUT FEAR. By Grantly Dick Read. New York: Harper, 1944. 259 pp. Price, $2.75.

ON THE INFLUENCE OF TRADES, PROFESSIONS, AND OCCUPATIONS IN THE UNITED STATES, IN THE PRODUCTION OF DISEASE. By Benjamin W. McCready. Baltimore: Johns Hopkins Press, 1943. 127 pp. Price, $1.75.

HEALTH FOR THE HAVING. By Dr. William R. P. Emerson. New York: Macmillan, 1944. 146 pp. Price, $1.75.

FUNDAMENTALS OF PERSONAL HYGIENE. By Walter W. Krueger. 4th ed. Philadelphia: Saunders, 1944. 315 pp. Price, $1.75.

TRENDS IN NURSING HISTORY. By Elizabeth Marion Jamieson and Mary Sewall. 2nd ed. illus. Philadelphia: Saunders, 1944. 651 pp. Price, $3.00.

EDUCATION AND HEALTH OF THE PARTIALLY SEEING CHILD. By Winifred Hathaway. New York: Columbia University Press, 1943. 216 pp. Price, $2.50.

PHYSICAL FITNESS FOR GIRLS. By Rosalind Cassidy and Hilda Clute Kozman. New York: Barnes, 1943. 223 pp. Price, $2.00.

FITNESS FIRST. By Hilda Clute Kozman and Rosalind Cassidy. New York: Barnes, 1943. 32 pp. Price, $.60.

PHYSICAL FITNESS FOR BOYS. A Manual for the Instructor of the Service Program. By Ben Miller, Karl W. Bookwalter and George E. Schlafer. New York: Barnes, 1943. 457 pp. Price, $3.00.

WAR AND CHILDREN. A Message to American Parents. By Anna Freud and Dorothy T. Burlingham. New York: International University Press, 1943. 191 pp. Price, $2.00.

ENCYCLOPEDIA OF CHILD GUIDANCE. Edited by Ralph B. Winn. New York: Philosophical Library, 1943. 456 pp. Price, $7.50.

THE SEVEN MYTHS OF HOUSING. By Nathan Straus. New York: Knopf, 1944. 314 pp. Price, $2.75.

DENTAL FACILITIES IN PHILADELPHIA. A Survey of Sixty Dental Clinics. Philadelphia: Health Division, Council of Social Agencies, 1943. 46 pp. Price, $.10.

MAURICE ARTHUS' PHILOSOPHY OF SCIENTIFIC INVESTIGATION. Translated from the French, with an Introduction by Henry E. Sigerist. Baltimore: Johns Hopkins Press, 1943. 26 pp. Price, $.75.

VITAL STATISTICS OF THE UNITED STATES. Supplement 1939–1940, Part III. Washington: U. S. Department of Commerce, Bureau of the Census, 1943. 581 pp. Price, $1.75.

PRELIMINARY DRAFT OF A GUIDE TO THE EVALUATION SCHEDULE. By George T. Palmer for the Subcommittee on Manual of Practice and Appraisal of Local Health Work of the Committee on Administrative Practice, American Public Health Association, 1944. 48 pp.

BIRTHS, INFANT MORTALITY, MATERNAL MORTALITY. Graphic Presentation, 1940. Washington: U. S. Department of Labor, Children's Bureau, 1943. 34 pp. Price, $1.00.

SOCIAL WORK AT ITS FRONTIERS. New York: American Association of Social Workers, 1943. Series of Reprints from *The Compass*.

A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

RAYMOND S. PATTERSON, PH.D.

The Operator Will Recover—A hair-raising story of gasoline fumes from a flooded carburetor filling the well of a sewage pump and when set off by the spark from a control switch, blowing the pump house to bits, including a heavy concrete flooring. You'll have a more wholesome respect for present-day rationed gasoline after reading this.

BOGERT, C. L. Explosion Wrecks Pumping Station. Sewage Works Engin. 15, 1:8 (Jan.), 1944.

Quote—The Government Printing Office is today the largest single industry of its kind in America, if not the entire world. Unquote. That startling statement has so floored me that I don't remember much about the rest of the item except that the industrial hazards there seemed pretty well taken care of. Despite wartime paper needs the Congressional Record goes windily on!

BRANDT, A. D., and REICHENBACH, G. S. Lead Exposures at the Government Printing Office. J. Indust. Hyg. & Toxicol. 25, 10: 445 (Dec.), 1943.

They Need Better Diets—In a group of pregnant women it was found that only 10 per cent consumed diets which met recommended standards of protein content. Protein in the diet and the size of the infant were found to be related. In earlier reports in this study, the mother's food was shown to have a profound effect upon the health of the infant. Reprints of the three papers in the series may be obtained by writing the Harvard School of Public Health.

BURKE, B. S., *et al.* Nutrition Studies During Pregnancy. J. Pediat. 23, 5:505 (Nov.), 1943.

Peering Into the Future—Much can be done through health education to make us a healthier nation, and that is the direction in which future health administration will proceed, says one who has earned the right to his opinion.

DUBLIN, L. I. The Duration and Thereafter for Public Health Nursing. Pub. Health Nurse. 36, 1:3 (Jan.), 1944.

No One Is Immune to This—There is not much public health in this article, but it is a most readable account of a completely unbelievable racket. You will be amused but you will be left wondering when your particular job may become a tempting objective for a scalawag.

FRYE, J. G. Battling the Tank Repair Racket. J. Am. Water Works A. 35, 12: 1574 (Dec.), 1943.

It Was Excellent—What was? See subject of this paper.

HEAGERTY, J. J., and MARSHALL, J. T. State of Health of the People of Canada in 1942. Canad. Pub. Health J. 34, 12:529 (Dec.), 1943.

Hunt Out This Issue—As a warning against the use of the discredited pulmotor now parading under the name of "resuscitator," this paper should be known to all health workers, even those who may have only a remote interest in first aid and early care.

HENDERSON, Y. The Return of the Pulmotor as a "Resuscitator." A Back-Step Toward the Death of Thousands. Science. 98, 2556:547 (Dec. 24), 1944.

Why Dairy Products Are Scarce—You should have at tongue's end the information furnished in this authoritative statement, as a ready answer to

that subversive pest who snarls about the shortage of butter "because it is going to the Russians." Despite the greatest number of dairy cattle ever kept and an improvement in production per cow, butter is scarce chiefly because more people can buy it nowadays —thank God! The figures are here.

HULT, M. Availability of Dairy Products in Coming Months. J. Am. Dietet. A. 20, 1:12 (Jan.), 1944.

How Much Mental Ill Health?—A survey of all the major surveys conducted and published during the last 15 years upon the prevalence, incidence, and expectancies of mental ill-health leads to the conclusion that such studies are basically incomparable and disappointing. If intelligent planning depends upon knowledge of the magnitude of the problem, then apparently we haven't a particularly strong need to lean on in this particular swamp of ignorance.

LEMKAU, P., *et al.* A Survey of Statistical Studies on the Prevalence and Incidence of Mental Disorder in Sample Populations. Pub. Health Rep. 58, 53:1909 (Dec. 31), 1943.

From Tobacco Mosaic to the Rickettsias—Though the author calls his five thousand word essay (with 93 references) a brief summary limited in scope, the chances are you will find in it plenty of meat for one evening's tussle with scientific English. But if you will sharpen your concentration you will be repaid for the effort.

LENNETTE, E. H. Recent Advances in Viruses. Science. 98, 2550:415 (Nov. 12), 1943.

Raw Milk Not the Sole Offender—Packing-house workers have a habit of eating partially cooked meat, a finding which is suggestive in the epidemiology of Brucellosis in this occupational group. Do you suppose other food handlers are similarly addicted?

LEVINE, M. G. Brucellosis in Packing-House Workers. J. Indust. Hyg. & Toxicol. 25, 10:451 (Dec.), 1943.

Confident England—Since World War I, one-third of the population of England has been rehoused. Other improvements in national health are recounted, as a backdrop for the health protection schemes adopted during World War II. Despite the exigencies of the day, the British medical authorities bravely look to the future, and envision a comprehensive public medical service.

MACNALTY, A. S. Britain's Development of Preventive Medicine. Canad. Pub. Health J. 35, 1:10 (Jan.), 1944.

Rats Are Persistent Beasts—Exterior walls placed about old buildings in the hope of keeping out rats must be el-shaped with an underground flange extending out from the building if they are to be effective. Then all rats inside the building must immediately be killed.

PORGES, R. The Use of Curtain Walls in Rat Proofing. Pub. Health Rep. 58, 52:1881 (Dec. 24), 1943.

Salus Populi Suprema Est Lex—Misconceptions, that social medicine is synonymous with (a) preventive medicine, and (b) socialized medicine, are ably and provocatively explored by an Oxonian professor. We are standing at the beginning of the third epoch in preventive medicine, he says, and he outlines the nature of the new socio-medical problems confronting health and medical leaders. He ends, "notably in the land of our most virile and victorious ally, there have been important experiments in social medicine and hygiene from which we have much to learn." He is not referring to the U.S.A., I take it!

RYLE, J. A. Social Medicine: Its Meaning and Its Scope. Milbank Quart. 22, 1:59 (Jan.), 1944.

Significant Quarter Century—Russia is a strange place. The poor, abused people there have no freedom—to buy patent medicines, nostrums, and expensively useless beauty aids—for the commissariats have charge of the production of all medical commodities. The miserable wretches are not free to be healed by nature-quacks, bone-benders, or faith healers, for the same commissariats control the schools for the training of all medical personnel. Incidentally, the commissariats have charge of health education, health promotion and recreation, medical services, and rehabilitation.

SIGERIST, H. E. Twenty-five Years of Health Work in the Soviet Union. Am. Rev. Soviet Med. 1, 1:67 (Oct.), 1943.

First Need Is a Good Water Supply—Water supply additions and improvements to the tune of eight hundred millions will be required when the war is over, say these surveyors of our sanitary needs.

STREETER, H. W., and RANERI, R. National Inventory of Needs for Sanitation Facilities. Pub. Health Rep. 59, 1:1 (Jan. 7), 1944.

Nowadays We Acknowledge Our Slums—Time was when the local chamber of commerce and city officials would scream to high Heaven that no slums existed in the fair city of . . . (deleted by the censor), but all is changed now. Reasons are discussed.

TWICHELL, A. A. A Yardstick for Postwar Housing. Pub. Health Nurs. 36, 1:12 (Jan.), 1944.

Some Fat Children Eat Less—Here are two findings which will give you something to mull over: most high school students do not need as many calories as have been recommended for these ages, and variation in needs of individual students is so great that no average can be considered a reliable evaluation of adequacy. It would seem that the next move was the National Research Council's.

WEIL, D. G. Medical Evaluation of Nutritional Status. Milbank Quart. 22, 1:5 (Jan.), 1944.

Healthy Homes—Something about the progress in improving housing in the United States under the aegis of this association's committee is recounted for our Canadian brethren. Let's hope that the prediction—in the next peace era we can look forward to notable advances—comes true: there will be plenty of Americans who will do their best to hamper the work.

WINSLOW, C.-E. A. Housing and the Health Officer. Canad. Pub. Health J. 35, 1:1 (Jan.), 1944.

ASSOCIATION NEWS

Professor Winslow Assumes Editorship

As the Journal goes to press, the Editorial Board is able to announce the appointment of Professor C.-E. A. Winslow as Editor of the Journal, beginning with the April issue, and succeeding Dr. Harry S. Mustard whose resignation as Editor is announced in the editorial columns of this issue.

Professor Winslow has been and is so closely identified with Association affairs, through the Committee on Administrative Practice, which he served as Chairman for 15 years and the Committee on the Hygiene of Housing, which he has chaired since its creation 7 years ago, as to need no introduction to Journal readers. His other Committee and Section connections have been numerous, and he has contributed regularly to the Annual Meetings and the Journal. He was elected President of the Association in 1926, and received a 40 year membership certificate and the Sedgwick Memorial Medal in the same year, 1942.

He is as well known among heating and ventilating engineers, bacteriologists, and housing experts as to public health workers. His bibliography is long and impressive, including hundreds of articles, pamphlets and such books as *The Life of Hermann M. Biggs, The Evolution and Significance of the Modern Public Health Campaign, A City Set on a Hill, Health on the Farm and in the Village,* and *Health Under the "El."* His latest book is *The Conquest of Epidemic Disease.*

Professor Winslow is Anna M. R. Lauder Professor of Public Health at Yale University, New Haven, Conn.

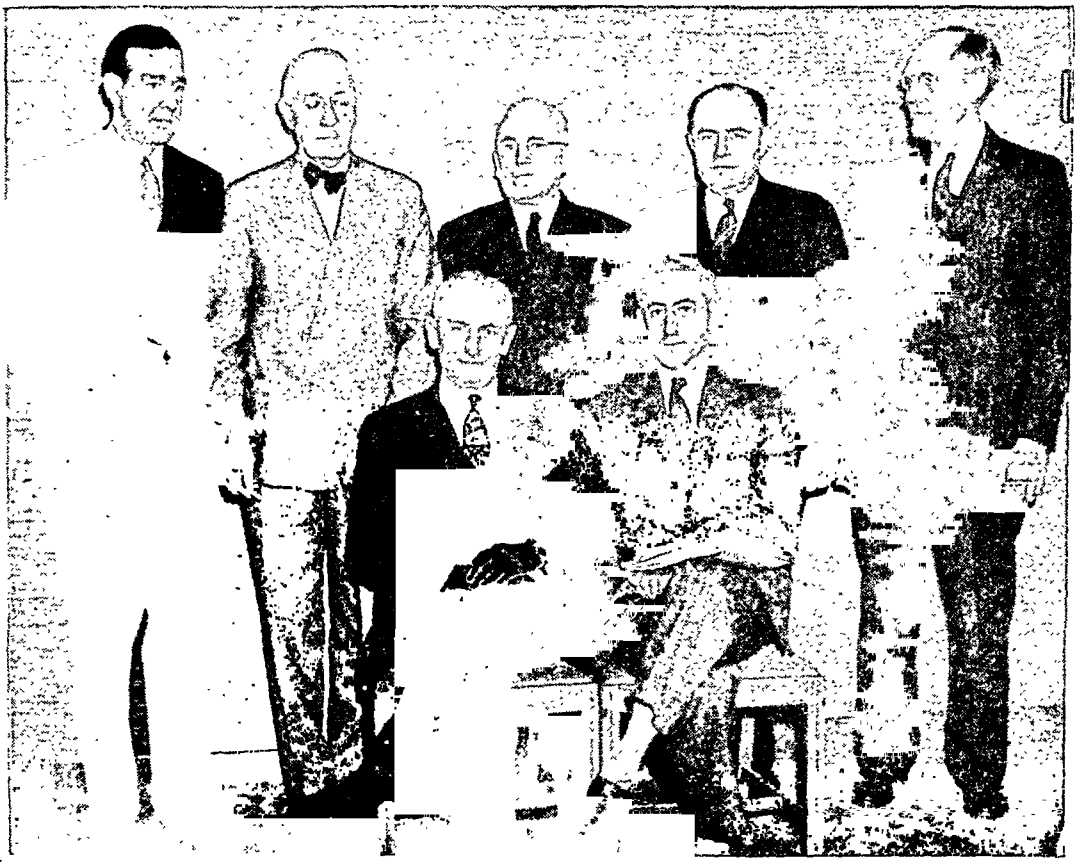
Executive Board Meeting

THE Executive Board of the American Public Health Association met in New York on January 28 and discussed many important Association matters. Present were Abel Wolman, Dr.Eng., *Chairman,* James A. Doull, M.D., Hugh R. Leavell, M.D., Edward G. McGavran, M.D., Charles F. Wilinsky, M.D., C. C. Young, D.P.H., and Reginald M. Atwater, M.D., Executive Secretary. Unable to be present were Louis I. Dublin, Ph.D., the Treasurer, John J. Sippy, M.D., President-elect, and Felix J. Underwood, M.D., President.

The Board reviewed Association affairs since the Annual Meeting and was gratified with the favorable financial position at the end of 1943. Total income for the year was $194,479.25 and total expense $186,007.39. Association membership has reached a record high of 8,022, representing a net gain of about 800 members during the year. Appreciation was expressed to the members and Fellows who contributed to this gain by submitting the names of prospective members. The total *Journal* circulation now exceeds 11,200 copies each month, an increase of almost 10 per cent in January, 1944. The Board recognized the increased activity in the Book Service, the Information Service, and the Employment Service, as well as in all other departments.

The resignation of Dr. Harry S. Mustard as Editor of the *American Journal of Public Health* was received with deep regret and a resolution expressing appreciation to Dr. Mustard for his extraordinarily effective leadership during his term of service was unanimously approved. An editorial on his retirement appears elsewhere in this issue.

There was unanimous agreement that



AMERICAN PUBLIC HEALTH ASSOCIATION EXECUTIVE BOARD MEETING, JANUARY 28, 1944

Left to right: Standing: Hugh R. Leavell, M.D., Louisville, Ky.; C. C. Young, D.P.H., Lansing, Mich.; James A. Doull, M.D., Cleveland, Ohio; Edward G. McGavran, M.D., Clayton, Mo.; Reginald M. Atwater, M.D., Executive Secretary. Seated: Charles F. Wilinsky, M.D., Boston, Mass.; Abel Wolman, Dr.Eng., Baltimore, Md. (Absent: Louis I. Dublin, Ph.D., New York, N. Y., Treasurer; John J. Sippy, M.D., Stockton, Calif., President-elect; and *Felix J. Underwood, M.D., Jackson, Miss., President.)*

there should be an Annual Meeting in 1944, and the Executive Board approved in principle a meeting in Chicago. Recognizing that suitable dates and hotel arrangements may be difficult to secure in that city, the Board voted to accept an invitation to hold a War-time Conference in New York City if space and time offer insuperable obstacles in Chicago. The membership will be advised when a definite decision is reached.

Authorization was given for the participation by the Association in the publication of a *Glossary of Terms for Use in Water Control Engineering* in collaboration with the American Society of Civil Engineers, the American Water Works Association, and the Federation of Sewage Works Associations.

Enthusiastic approval was given to a "repeat performance" of a series of meetings in the Midwestern and Western states in May and June, and plans are going forward which give evidence that the second tour will be as successful as the first.

It was pointed out that the 15th Annual National Health Honor Roll will be concluded this April with the expected participation of about 100 cities and counties. Beside this number at least 150 communities in 14 states will also submit schedules as the result of an effort to interest those communities which did not wish to enter a competi-

tive contest yet were desirous of preparing an inventory of health assets and liabilities for national grading and comments. It seems that the Contest plan, carried on over the years, has laid the foundation for the next desirable objective, namely, the formation of a national reporting area for health practices. This new plan had brought out a favorable response from the state health departments in the 14 states reached, a response that was not forthcoming under a continuation of the Contest or Honor Roll plan. This will involve the direct participation of state departments of health both in urging the annual inventory upon the communities and in the distribution of schedules, as well as in the return of filled out schedules through the state departments of health. The public reception of the recent publication, *Health Practice Indices,* has been most cordial.

Appointments were made to the Standing Committees and these will be covered in the Committee List which will appear in the April *Journal*, together with other committee appointments and Section appointments which were confirmed.

The resignation of Dr. Henry F. Vaughan as Chairman of the Committee on Administrative Practice was regretfully received. The Executive Board acknowledged the Association's indebtedness to Dr. Vaughan for his able leadership and expressed the hope that his health would soon permit him to resume active participation in Association affairs.

Gratification was expressed with the progress being made by the Merit System Unit of the Committee on Professional Education in making examination material available to an increasing number of states, a service for which the federal agencies have indicated continued approval and appreciation. To date more than 65 examinations have been prepared for 14 states and 1 city.

The Executive Board considered at length the subject of public medical care and its relationship to the public health profession. It appointed Hugh R. Leavell, M.D., as its representative to review this field. Dr. Leavell has chosen to identify himself for the present with the new Subcommittee on Medical Care of the Committee on Administrative Practice which met on February 11.

Consideration was given to the possibility of broadening participation in the election of Association officers, and the Executive Secretary was instructed to present to the Governing Council in advance of its next meeting a report outlining several choices of methods which may be more acceptable than the one employed at present.

The applications of 12 concerns for Sustaining Membership were approved, bringing the total of Sustaining Members in the Association to 33. Those elected at the meeting were: American Bottlers of Carbonated Beverages, The Borden Company, Clay-Adams Company, Inc., Effervescent Products, Inc., Hoffman-LaRoche, Inc., Holland-Rantos Company, Inc., International Equipment Company, The Macmillan Company, Sealright Company, Inc., E. R. Squibb & Sons, The Upjohn Company, and the Winthrop Chemical Company. The Executive Board received with appreciation a contribution to the work of the Association from the Ciba Pharmaceutical Products Company, Inc.

The matter of adequate compensation for professional public health personnel, in line with the qualifications for various classes of public health workers established by the Committee on Professional Education, was discussed. The Executive Secretary was authorized to seek the aid and support of other professional societies with an aim to establishing adequate salary scales.

STANDARD METHODS FOR THE EXAMINATION OF DAIRY PRODUCTS

* * *

Corrections in the Text of the Eighth Edition of Standard Methods for the Examination of Dairy Products

The following corrections are being incorporated in a reprinting of the Eighth Edition of *Standard Methods for the Examination of Dairy Products*. They are reproduced here so that those possessing copies of the Eighth Edition may make the corrections therein. There are no other changes in the reprinting.

Separates of the corrections are available and may be received on request to the Association office, 1790 Broadway, New York 19, N. Y.

Page 8. Insert the following sentence between "gauge" and "Use," 2nd line "To insure sterility, rely upon the temperature in the autoclave rather than upon the pressure."

" Insert sentence following line 9, as follows: "In emergencies, suitable pressure cookers may be substituted for autoclaves."

" Line 10. Insert "or pressure cookers" after "sterilizers" at end of line.

Page 10. Change lines 4–10 to read "Clean cold water for rinsing the stirrer and (1) another can containing hot water kept continuously at not less than 180° F. by passing live steam through it, or (2) another can containing a hypochlorite solution (strength maintained at not less than 100 parts per million of available chlorine) for the practical sterilization of the stirrer. Rinse the stirrer first in cold water and then allow it to stand in the hot water or chlorine solution while making preparations to take the next sample (Figure I). Where plate counts are made on the collected samples, plate samples of the sterilizing solution each day when sampling is completed."

Page 19. Add new sentence just before the last sentence of the first complete paragraph: "Bottles with screw cap closures may be used where leak proof closures are assured. (These may require new liners in caps after each use.)"

" Insert an additional sentence at end of paragraph under "3. Petri Dishes" "Remove plates from containers when these are placed in the incubator chamber in order to permit plates to reach the incubation temperature promptly."

Page 20. Fifth line from bottom. Insert "anhydric" between the words "use" and "incubators."

" Third line from the bottom insert between "high" and "because" "(or equivalent space)."

Page 21. Line 2. Section 8. Water. For the word "distilled" in the second line of this paragraph substitute "buffered phosphate dilution water prepared, in conformity with Section K, page 126." This brings the Dairy Products requirements for dilution water into conformity, with the statement in *Standard Methods of Water Analysis*, Section XII, page 156 and Section V, page 207.

Page 24. Last line delete "containing unmeasured quantities."

Page 27. End of Section 4, add new paragraph reading "Use a separate sterile pipette for each sample and for each dilution. Do not rinse pipettes in dilution waters."

Page 28. Section 6. Cleaning Pipettes. Rewrite as follows:
"Because improperly cleaned pipettes may cause incomplete deliveries, thoroughly wash pipettes with suitable detergents after each use and periodically soak them overnight in a strong cleaning solution. A bichromate-sulfuric acid cleaning solution may be prepared by adding 50 gm. sodium bichromate to 200 ml. of water in a glass or earthen container, and then cautiously add 300 ml. of sulfuric acid, commercial grade or Babcock testing grade. Wash acid-treated glassware thoroughly in alkaline waters and then thoroughly and repeatedly rinse in clean water. Tests on the rinsed glassware for presence of residual acid or alkali may be made by using appropriate indicators, such as brom thymol blue, Andrade's, etc."

" Last line change "42°" to "44°."

Page 29. Line 10, add sentence reading: "Where clay tops are used, inversion of plates during incubation is unnecessary."

" Under VI. Incubation, change first sentence to read: "Arrange plates or piles thereof on the shelves of incubation chambers so that they are separated horizontally from each other and from the top and walls of the chamber by at least 1 inch."

Page 30. Line 6. Add to paragraph "Accurate maximum and minimum recording thermometers or automatic temperature controlling and recording devices may be found desirable and may be used."

Page 31. Rewrite as follows:

I. SELECTING SUITABLE PLATES

After incubation of two plates per sample, one from each of two dilutions, it is expected that the number of colonies on at least one, and perhaps occasionally both plates, will be between 30 and 300.[33, 34] The optional use of more than two plates per sample is allowed. These extra plates may be either of the same or of different dilutions. Count all colonies including those of pin point size and include them in the officially reported count.

Report as the standard plate count the number of colonies on the plate yielding between 30 and 300 colonies (or the average if the number on both plates is within the limits) except (1) where more than one plate per dilution is made and (2) where there are no plates with colonies within the 30 and 300 limit.

(1) If two or more plates are made from the same dilution and only one has colonies within the 30 to 300 limit, use the others of the same dilution to determine the average count. In certain rare instances, this might include the counts from successive dilutions as some plates of the lower dilution might have less than 300 colonies and others more than 300, while some plates from the higher dilution might have more than 30 colonies and others less. In such cases use the average of all of the plates.

(2) Use the plate with nearest 300 colonies for the standard plate count if the dilutions selected are too low to give colonies within the 30 to 300 limits. Use counts from plates with less than 30 colonies only when no other plates are available.

Regardless of any of the above requirements, if the number of colonies developing on the suitable plates from successive dilutions is such that the higher count is more than twice the lower count, use the count or counts from the plate or plates which give the lower

count. Normally these will be the plate or plates with the number of colonies nearest 300.

Page 32. At top of page 32 start new paragraph with first sentence "If the number of colonies . . ."

" End of first partial paragraph add "If none of the plates show colonies, report the result of the analysis as unsatisfactory."

" Under 2. Counting Aids, change fourth complete sentence 2nd line above cut to read: "Examine carefully any doubtful specks in the agar using additional magnification where required to distinguish colonies from dirt specks."

Page 33. Under 4. Spreading Colonies, delete 2nd sentence which reads: "Count each as a single source." Insert the following in place of the 3rd complete sentence to read: "The first type is a chain or chains of colonies which appear to arise from the disintegration of more or less compact clumps of bacteria found in the milk. If but a single chain of colonies is formed count the chain as one. If several chains are formed count the approximate number of chains. Do not count each individual colony as one.

" "In the second and third types of spreaders, count each spreader as a single source. Discard plates where the spreader covers more than half of the plate."

Page 35. Under 5. Estimating Colonies on Crowded Plates, substitute the following for all except the last sentence: "Where the number of colonies on the plate appreciably exceeds 300, count colonies in portions of the plate representative of colony distribution and estimate therefrom the total number on the plate. Where there are from 5 to 10 colonies per sq. cm. area, count the colonies in from 12 to 14 different areas, selecting, if representative, the 6 consecutive squares diagonally across the plate and the 6 consecutive squares, at right angles to the first diagonal. Where there are more than 10 colonies per sq. cm. area, count colonies in 4 such sq. cm. areas, selecting, if representative of colony distribution, the 4 areas near the center. Multiply the average per sq. cm. area as found by the appropriate factor, to obtain the number of colonies per plate."

Page 46. Line 1 under Figure XI, change "Spread the films either" to "Spread the films evently."

Page 52. Line 10, end sentence with "rapidly." Delete "or" and start next sentence with "Otherwise."

Page 64. Line 5 from bottom, change "visual" to "visible."

Page 79. Second paragraph, second sentence under Presumptive Test, 12th line from bottom of page, change to read: "In pasteurization control, for example, 5 tubes or even 3 tubes each inoculated with 1 ml. (or 10 ml.) are sufficient where frequent routine analyses have shown that results are likely to be negative. In this work as in bacterial count work, a simple examination of routine samples taken frequently will give more useful information than a more complete examination of samples taken at infrequent intervals."

Page 107. 4th complete paragraph 13th line from bottom of page change "The National Aniline and Chemical Company" to read: "The National Aniline Division of the Allied Chemical Company."

Page 128. Substitute the following for the statement in line 15 beginning: "20 times the number of colonies" to read "10 times the sum of the number of colonies on the two plates receiving 1 ml. each of rinse solution, or 100 times the sum of the number of colonies on the two plates to which 0.1 ml. each was added, equals the estimated number of colonies per bottle."

Page 195. First line "45 ml." not "45 gm."
4th line under 3. Dried Eggs. "99 ml." not "99 gm."

Page 267. Line 5 under C. Apparatus, insert "C." after 34°–37°.

Page 271. Under C. Apparatus, line 1, pipettes, line 2, tubes. Line 3—tubes, *150 x 15 mm.*
Under D. Permanent Color Standards—a. Color solution red, delete—"0.58."

APPLICANTS FOR MEMBERSHIP

The following individuals have applied for membership in the Association. They have requested affiliation with the sections indicated.

Health Officers Section

Francisco Berio-Suarez, M.D., Comerio, Puerto Rico, Public Health Officer

Eugene S. Brown, M.D., Summersville, W. Va., Nicholas County Health Officer

Samuel J. Brownstein, M.D., 2059 Alta Ave., Louisville, Ky., Asst. Director of Health, Louisville and Jefferson County Health Dept.

Ruth R. Burroughs, M.D., Hinds County Health Dept., Jackson, Miss., Asst. Director

J. Lindsay Cook, M.D., Alamance County Health Dept., Graham, N. C., Health Officer

Ruth E. Dunham, M.D., 155 Flora Ave., Peoria 5, Ill., Asst. Surgeon (R), U. S. Public Health Service

Robert H. Fishbach, M.D., Lewis-Pacific Dept. of Health, Chehalis, Wash., P.A. Surgeon, U. S. Public Health Service

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Robert H. Johnson, M.D., Princess Anne, Md., Deputy State Health Officer

Dr. Felix Laragne, Service d'Hygiene, Port au Prince, Haiti, Sanitary Officer

John Mills, D.P.H., Fairlawn, Heathfield Rd., Liverpool 15, England, Asst. Medical Officer of Health

William R. Munson, M.D., Health Officer, Westport, Conn.

James A. Newcome, M.D., Carskadon Road, Keyser, W. Va., Mineral County Health Officer

Walter J. Riley, M.D., Sutton, W. Va., Medical Director, District No. 1, State Health Dept.

Capt. Saul Steinberg, M.C., V.D.C.O., Camp Carson, Colo., U. S. Army

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Bernadine Malinka, Room 225, State House, Indianapolis 4, Ind., State Director, National Foundation for Infantile Paralysis, Inc.

Harriet P. Pittman, Stoneleigh Hotel, Dallas 1, Tex., Texas Representative, National Foundation for Infantile Paralysis, Inc.

Evelyn Rahm, School of Public Health, Univ. of North Carolina, Chapel Hill, N. C., Graduate Student in Public Health Education

Laurence T. Rogers, Ph.D., 5005 Drexel Blvd., Chicago, Ill., Asst. Sec., Health Division, Council of Social Agencies

Margaret N. Shaub, 3108 Long Blvd., Nashville 5, Tenn., State Director, National Foundation for Infantile Paralysis, Inc.

Norma G. Silver, M.A., 640 Parkview Drive, Detroit 14, Mich., Exec. Sec., Metropolitan Detroit Health Council

Pauline C. Smith, R.N., A.R.C. South-Eastern Office, Atlanta, Ga., Itinerant Home Nursing Instructor

Peter C. Stone, 120 Broadway, New York, N. Y., Director of Chapters, National Foundation for Infantile Paralysis, Inc.

Jennie D. Stout, New Hanover Health Dept., Wilmington, N. C., Public Health Educator, State Board of Health

Donald M. D. Thurber, 2446 National Bank Bldg., Detroit 26, Mich., State Director, National Foundation for Infantile Paralysis, Inc.

Giddings B. Tiffany, 335 South Pacific St., Pittsburgh 24, Pa., State Director, National Foundation for Infantile Paralysis, Inc.

Ruth Williams, 621 Stockton St., San Francisco 8, Calif., Western Regional Director, National Foundation for Infantile Paralysis, Inc.

Mildred K. Wyckoff, 8047 Hamilton, Detroit 2, Mich., Health Educator, Dept. of Health

Public Health Nursing Section

Josefina Alvarez de Deliz, Monserrate 28, Santurce, Puerto Rico, Public Health Nurse, Venereal Disease Clinics

Shirle B. Armstrong, 1431 Milvia St., Berkeley 7, Calif., Public Health Nurse, Contra Costa Co. Health Dept.

Elizabeth S. Arundale, R.N., 750 Hinman Ave., Evanston, Ill., Field Nurse, Tuberculosis Institute of Chicago and Cook County

Elma Backstrom, R.N., 705–9th Ave. W., Ashland, Wis., Wisconsin State Indian Service Nurse, State Board of Health

Helen M. Carpenter, R.N., Provincial Board of Health, Parliament Bldgs., Victoria, B. C., Canada, Supervisor of Public Health Nursing

Carolyn G. DeBolt, R.N., Williams, Calif., Supervisor of Child Welfare and Attendance, Colusa County Schools

Jean Harper, R.N., 109 S. 32nd Ave., Omaha, Nebr., Asst. Prof. of Public Health Nursing, Univ. of Nebraska

Helen S. Haughton, R.N., 221 E. State St., Columbus, Ohio, Superintendent, Columbus Cancer Clinic

Dorotha A. Jackson, Wrangell, Alaska, Public Health Nurse, Alaska Territorial Dept. of Health

Dorothy C. Lowman, R.N., 719 Harrison Ave., Salt Lake City, Utah, Director, Public Health Nursing, State Board of Health

Lynn B. McCaffrey, 802 Second Ave., S., Nashville 10, Tenn., Educational Director, Nashville Public Health Nursing Council

Rosa Roura de Lopez, Nueva St. 3, Hato Rey, Rio Piedras, Puerto Rico, Public Health Nurse, Venereal Disease Clinic

Marion A. Schuler, R.N., Church Rd. & First Ave., Bensenville, Ill., Orthopedic Nurse, Univ. of Illinois, Div. of Services for Crippled Children

Elizabeth W. Sullivan, R.N., 27 Estelle Ave., Kentfield, Calif., Supervisor of School Nurses, San Rafael City Schools

Dorothy E. Tate, M.A., Box 377, Nanaimo, B. C., Canada, Supervisor, Public Health Nursing, Provincial Board of Health

Maudye H. Toups, R.N., 101 North Blvd., Baton Rouge, La., Supervisory Nurse, East Baton Rouge Parish Health Unit

Catherine O. Tracy, State Dept. of Health, Smith St., Providence, R. I., Director of Public Health Nursing

Marina Vazquez-Baez, Public Health Unit, Barranquitas, Puerto Rico, Supervisor of Public Health Nurses, Dept. of Health

Carmen E. Vazquez-Guerra, 31 Virtud St., Ponce, Puerto Rico, Supervisor of Nurses, Dept. of Health

Epidemiology Section

Alfred Cohn, M.D., 157 W. 57th St., New York 19, N. Y., Research Director, Gonococcus Research Unit, Dept. of Health

Leon H. Flancher, M.D., M.P.H., 3304 Terrace Drive, Des Moines, Iowa, Director, Div. of Tuberculosis, State Dept. of Health

Capt. Emanuel B. Schoenbach, M.C., 615 N. Wolfe St., Baltimore 5, Md., Consultant to Secretary of War

Unaffiliated

Dr. Margaret Bechhofer, 315 W. 57th St., New York, N. Y., Medical Inspector of Schools

Evelyn Flook, 1026 15th St., N.W., Washington 5, D. C., Assoc. Administrative Analyst, U. S. Public Health Service

Elsie C. Hochmeister, 1571 Boulevard, West Hartford 7, Conn., State Clerk-Field Secretary, National Foundation for Infantile Paralysis, Inc.

Wilbur E. Powers, 330 Hamilton Ave., No. 3, Trenton 9, N. J., Asst. to the Secretary and Chief Inspector, New Jersey State Board of Pharmacy

DECEASED MEMBERS

Fred Adams, M.B., D.P.H., Windsor, Ontario, Canada, Elected Member 1914, Elected Fellow 1922, Charter Fellow, Health Officers Section

J. J. McShane, M.D., Dr.P.H., Springfield, Ill., Elected Member 1915, Elected Fellow 1922, Charter Fellow, Epidemiology Section

H. Allen Moyer, M.D., Charlotte, Mich., Elected Member 1939, Unaffiliated

EMPLOYMENT SERVICE

The Association Employment Service seeks to bring to the attention of appointing officers the names of qualified public health personnel and to act as a clearinghouse on employment. This is a service of the Association conducted without expense to the employer or employee.

From the registry of persons available, selected announcements are published from time to time. Appointing officers may obtain lists of all registrants on request.

Address all correspondence to the Employment Service, American Public Health Association, 1790 Broadway, New York 19, N. Y.

POSITIONS AVAILABLE

Wanted: A physician trained in tuberculosis to assume administrative control of the Bureau of Tuberculosis in an eastern city of 200,000 population. Salary $3,900–$4,500 plus cost of living adjustment. Address Box B, Employment Service, A.P.H.A.

Sanitarian wanted: Preferably with Bachelor's degree or engineering degree, plus public health experience or training. Must have own car. Applicant with lower qualifications will be offered an opportunity to take a short, free indoctrination course. Salary $1,920 per year with travel allowance of $50 per month, if qualified. Apply Dist. Dept. of Health, No. 6, Central Office, Newberry, Mich., Dr. Franklin.

Wanted: Pediatrician to supervise medical care of children at cerebral palsy center being established by private institution in coöperation with Illinois Division of Services for Crippled Children. Salary commensurate with experience and training. For further information write Lawrence J. Linck, Director, Division of Services for Crippled Children, 1105 So. Sixth St., Springfield, Ill.

The Department of Health, New Jersey, whose industrial health activities have expanded rapidly during the present war, has announced its need for two full-time industrial hygiene physicians for its Industrial Hygiene Service. As one of the leading states in the production of war materials, New Jersey offers unusual opportunities for gaining experience in occupational disease control besides giving the physician a chance to make a valuable contribution to the war effort. The principal duties of the selected physicians will be consultations in regard to the following: control of occupational diseases; industrial toxicological problems; evaluation of adequacy of plant medical services; promotion of measures which will reduce absenteeism from non-occupational causes; and conduct of industrial health education activities. Physicians interested in these positions should write to the Department of Health, Trenton, N. J.

Merit System for Personnel Administration in Delaware will set examinations for 3 positions in the Delaware State Board of Health shortly. The positions open for examination, together with the beginning salaries, are: Deputy State (County) Health Officer ($3,800), Pediatrician ($3,600), and Medical Social Consultant ($2,400).

These examinations will be unassembled, but successful candidates will be expected to appear in Delaware for an oral interview which will be a weighted part of the examination. Appointments may be expected soon after the examinations are conducted.

Information and specifications as prepared for each position may be secured by communication with the Merit System Supervisor, P. O. Box 1911, Wilmington, Del., and application for examination must be made on the official form.

The Milwaukee Health Department is interested in obtaining an instructor in hospital nursing to conduct a student educational program in its communicable disease hospital. Salary offered begins at $125 per month with maintenance, and increases of $5 per month each year until $135 has been reached. To this basic salary there has been added a cost of living bonus of $30.64 per month, making the total beginning salary $155.64 plus maintenance. Apply to Dr. G. F. Burgardt, Deputy Commissioner of Health, Milwaukee, Wis.

Wanted: Public health physicians in Texas. George W. Cox, M.D., State Health Officer, Austin, Tex.

Hawaiian Territorial Board of Health seeks trained engineer to supervise rodent plague control program. Salary range from $331.67 to $398.33 per month subject to retirement deductions plus bonus. Position under Territorial civil

service system with classification of P-4. For further details address A.P.H.A. Employment Service.

Wanted: Physical therapist by Crippled Children's Division. Should be graduate of a school of nursing or of college, with a major in physical education or science; have completed a course in physical therapy; should have had experience in physical therapy, preferably with children. Write for application blank to Merit System Council, 416 Henry Building, 309 S.W. 4th Ave., Portland 4, Oregon.

Psychiatric case worker desired for mental hygiene clinic, Department of Health, Peoria, Ill.

Senior Sanitarian, Alaska Health Department. Minimum requirements 2 years college, 6 months public health course, 2 years' experience. Two additional years' experience acceptable instead of each year college. Monthly salary $235–$265. Mary B. Pool, Alaska Merit System, Juneau.

Michigan announces civil service positions now open for orthopedic public health nurse, Grades II and III classes with the Michigan Crippled Children's Commission. Salary range: Grade II $230 to $270 per month; Grade III $280 to $340 per month. Grade II not under 23, Grade III not under 25. Must have completed course in orthopedic nursing or physical therapy in approved school. For Grade III position a full-time course of at least 9 months' duration is required. Must have 3 years' experience in public health nursing, one year of which shall have been in supervisory capacity. For Grade III position one additional year of nursing and one additional year of supervisory experience required. Eligibility for certificate in public health nursing and registration as a nurse in Michigan. For further information write Michigan Civil Service Commission, 310 No. Grand Ave., Lansing 4, Mich.

Industrial Hygiene Toxicologist. Calls for person of chemical or chemical engineering background. Position, supervising of chemical work of industrial hygiene service and industrial hygiene laboratory; designing special apparatus for field studies on occupational disease problems; conducting field and laboratory analyses of toxicological exposures in industry; keeping records, interpreting results and preparing records. Requirements, knowledge of chemical laboratory methods and equipment; procedures for qualitative and quantitative analysis of organic and inorganic chemistry; knowledge of chemical methods of determining toxic materials in industry; familiarity with petrographic methods of mineralogical analysis. Immediate temporary appointment will be made, to be followed later by civil service examination to determine permanent status. Salary $2,900 base, plus $100 a year war adjustment, or total of $3,000 per year. Travel expenses also allowed. Must be U. S. citizen. Resident of any state may apply. Write J. Lynn Mahaffey, M.D., Director of Health, State Department of Health, Trenton 7, N. J.

Wanted: Public Health Nurse. Salary $175 per month and full maintenance, plus $25 per month for car expense. Must furnish own car. Write Paul D. Crimm, M.D., Director Boehne Tuberculosis Hospital, Evansville 12, Ind.

City of 70,000, southeastern U. S., seeks qualified health commissioner between the ages of 30 and 45, draft exempt. Salary $4,500 plus auto allowance of $300 per year. **Box V**, Employment Service, A.P.H.A.

Assistant Sanitarian in well established Ohio department of health. Minimum experience 2 years required. Merit system prevails. Salary $1,800–$2,400. Write **Box K**, Employment Service, A.P.H.A.

Wanted: Bacteriologist to conduct virus laboratory in the Laboratory Section of the Health Division, City of St. Louis. Applicant must have graduate degree with research and practical experience in virology. Salary range from $220 to $360 a month, depending upon ability. Position under Civil Service. Write **Box W**, Employment Service, A.P.H.A.

Wanted: Statistical clerk, preferably with college degree and experience in health education, to study and analyze vital statistics in suburban and rural county adjacent to Washington. Special emphasis on relation to health department services and participation in Health Honor Roll. Address V. L. Ellicott, M.D., Dr.P.H., Montgomery Co., Rockville, Md.

Wanted: Medical Social Worker for Dept. of Health, Peoria, Ill. Address Director Maternal and Child Health, Dept. of Health, Peoria, Ill.

Wanted: Physician in eastern city of 200,000 population as Director of Bureau of Maternal and Child Hygiene. Address **Box C**, Employment Service, A.P.H.A.

Wanted: Physician (male), American citizen, draft exempt, trained in pediatrics, for a 3 year position as chief resident and

research assistant in fine pediatric tuberculosis hospital, New York. Good salary and maintenance. Only one intensely interested in research need apply. Send full details of qualifications and photograph. Box R, Employment Service, A.P.H.A.

Wanted: X-ray technician to travel with portable x-ray unit taking chest x-rays at tuberculosis case finding clinics. Includes both industrial and school surveys. Salary $35 per week plus travel and maintenance when away from headquarters. Address Box M, Employment Service, A.P.H.A.

Wanted: Resident physician for plant in South America. Must have thorough knowledge of malaria, tropical medicine, and vector control. Must be eligible for licensure in British Colony. Address Box H, Employment Service, A.P.H.A.

Physician wanted as Director of Maternal and Child Health in western county health department. Preferably with training in pediatrics and venereology. Some venereal disease control work also. Man preferred but woman considered. Must be in good health. Salary $4,500 per year with car and expenses furnished. Position for duration of war. Address Box S, Employment Service, A.P.H.A.

Tuberculosis Association in large western city seeks a trained and experienced health education director, a director of medical social work, and a public health nurse supervisor. Attractive positions now open in agency with a dynamic program closely related to official groups. Address Box D, Employment Service, A.P.H.A.

U. S. Indian Service seeks physicians for service in the United States and Alaska. Address Office of Indian Affairs, Health Division, Merchandise Mart, Chicago 54, Illinois. Application blanks will be furnished upon request.

FOR OTHER POSITIONS AVAILABLE WRITE EMPLOYMENT SERVICE, AMERICAN PUBLIC HEALTH ASSOCIATION, 1790 BROADWAY, NEW YORK 19, N. Y.

In view of the current active demand for trained and experienced persons in public health, it is suggested that prospective employers communicate directly with the Employment Service, American Public Health Association, 1790 Broadway, New York 19, N. Y., for up-to-date lists of applicants.

POSITIONS WANTED

Administrative

Physician, age 37, M.D. Iowa, Dr.P.H. Harvard, specializing in tuberculosis, seeks position as medical director of a sanatorium or a state bureau of tuberculosis. Exempt from military service. **A-476**

Physician, M.D. University of Arkansas, M.P.H. Harvard, experienced as county health officer. Age 35. Will consider position as county or city health officer or director of a bureau. **A-506**

Physician, M.D. Yale, with private practice industrial medicine. Age 39 and draft exempt. Seeks opportunity as public health physician. **A-505**

Woman physician, experienced in public health education and school health service administration and supervision, seeks full- or part-time position, preferably southeastern New York State. **A-511**

Health Education

Woman with background of health education and public health nursing, experienced as teacher, supervisor, and writer, seeks teaching position of responsibility. **H-507**

Health educator with Master's degree in public health and some experience. Prefers position in official agency. **H-510**

Laboratory

Research bacteriologist. Unusually trained and experienced woman bacteriologist and serologist now occupying responsible position in state laboratory seeks research work of permanent character. **L-468**

Water chemist, bacteriologist, M.S. degree in Sanitary Chemistry. Age 36, draft exempt. Eight years' experience in state laboratory working on water, milk and sewage. Prefers Midwest or Pacific Northwest location. **L-469**

Miscellaneous

Public Health Nurse. B.S. in nursing, William and Mary College, age 53, seeks position as coördinator of public health nursing, educational director, or director student nurse public health program. Prefers Middle Atlantic States. **M-452**

NEWS FROM THE FIELD

NEW YORK STATE TRAINS SUBSTITUTE ENGINEERING PERSONNEL

According to the New York State *Health News,* the New York State Department of Health, as a wartime measure to meet a serious public health problem caused by a shortage in the ranks of its sanitary engineers, has evolved a plan calling for intensive on-the-job training of graduate civil engineers, the first 6 of whom have already been appointed. During the early months of the war promotions of junior engineers replaced 14 key men who were called to the military services, but replacements for 8 district sanitary engineers now expecting calls to the service have proved very difficult. After a canvass of practically the entire country, 8 graduate engineers have been obtained to fill the unexpected vacancies. They will be trained in public health engineering and will handle the work of this nature in the districts to which they will be assigned under the supervision of sanitary engineers in adjacent districts. Other unfilled vacancies remain to be filled.

DISTINGUISHED SERVICE MEDAL AWARDED TO BRIGADIER GENERAL LEON A. FOX

Brigadier General Leon A. Fox, M.C., U.S.A., F.A.P.H.A., was recently awarded the Distinguished Service Medal for "exceptionally meritorious and distinguished service in a position of great responsibility while serving as Health Director for the Caribbean and North Atlantic Engineer Division . . . During this period, in addition to his normal duties as Division Health Director, General Fox was charged with carrying out a health program of great magnitude in connection with construction work in the Caribbean bases, northern ferry routes, ferry routes across Africa, Pan American highway, Northwest Division and foreign missions located in Africa, Iran, and Iraq. Throughout, General Fox has demonstrated great foresight, energy, organizing ability, and inspiring leadership, which have contributed in large part to the successful prosecution of these important projects," according to a report in the *Journal of the A.M.A.*

RESEARCH FUND HONORS DR. VERANUS A. MOORE

President Edmund E. Day of Cornell University, Ithaca, N. Y., recently announced the endowment of a scholarship to be known as the Veranus A. Moore Research Fund. It has been established through an anonymous gift of $10,400 in honor of the memory of the former Dean of the State Veterinary College, Ithaca. The income from the fund, according to Dr. Day, will be used for research in clinical and preventive medicine.

Dr. Moore joined the American Public Health Association in 1896 and was a Fellow of the Laboratory Section. He died in 1931.

MEXICO CREATES A MINISTRY OF PUBLIC HEALTH AND ASSISTANCE

According to reports from Mexico City, the government has created a new Ministry of Public Health and Assistance effective October 15. Dr. Gustavo Baz is the Secretary or Minister. The Subsecretary is Dr. Manuel Martinez Baez; Chief of the Division of Public Health and Assistance in the States and Territories, Dr. Gustavo Viniegra; Chief of the Division of Public Assistance in the Federal District, Dr. Raul Fournier; Chief of the

Division of Maternal and Child Hygiene, Dr. Pedro Daniel Martinez; Chief of the Division of Epidemiology, Dr. Salvador Iturbide Alvirez; Chief of Division of Public Health in the Federal District, Dr. Salvador Gonzalez Reynoso; Chief of the Division of Foods and Drug Control, Dr. Demetrio Mayoral Pardo; and, in the Division of Sanitary Engineering, Engineer Luis Gerrero Arciniega.

Dr. Garza Brito continues as Dean of the School of Public Health and Hygiene.

Dr. Manuel Gonzalez Rivera is the Chief of the Division of Health and Education.

MASSACHUSETTS PUBLIC HEALTH ASSOCIATION ELECTS OFFICERS

At its meeting on January 27 in Boston, the Massachusetts Public Health Association elected the following officers for the coming year:

President: Harold W. Stevens, M.D.
Vice-Presidents: L. Jackson Smith, M.D., and Charles F. Wilinsky, M.D.
Secretary: Alexander A. Robertson
Treasurer: Catharine Atwood
Executive Committee: Ethel G. Brooks, R.N., Manfred Bowditch, G. Donald Buckner, Roy F. Feemster, M.D., and Edwin H. Place, M.D.
Representative to the Governing Council of the American Public Health Association: Raymond S. Patterson, Ph.D.
Alternate: L. Jackson Smith, M.D.

DR. CRABTREE APPOINTED TO UNRRA

The press on February 1 carried the announcement of the appointment of Dr. James A. Crabtree, formerly of Tennessee, who has been identified with health and safety activities of the federal government since 1934, as Acting Chief of the Health Division of the United Nations Relief and Rehabilitation Administration. The appointment was made by Herbert H. Lehman, Director-General, UNRRA. Dr. Crabtree was graduated from the University of Tennesee in 1925 and took postgraduate work at Johns Hopkins University School of Hygiene and Public Health in Baltimore.

TROPICAL MEDICINE COURSE ANNOUNCED AT DELAMAR INSTITUTE

Harry S. Mustard, M.D., the Director of the De Lamar Institute of Public Health, New York, N. Y., has announced that the Institute as a part of the College of Physicians and Surgeons of Columbia University would offer an intensive program of instruction in certain aspects of tropical medicine for a period beginning March 20 and continuing through May 13. Persons interested in the course should communicate with Dr. Mustard.

COLONEL BAYNE-JONES APPOINTED DIRECTOR OF TYPHUS COMMISSION

The War Department, Washington, D. C., recently announced the appointment of Colonel Stanhope Bayne-Jones * of the Army Medical Corps as Director of the Typhus Commission, succeeding Brigadier General Leon A. Fox * of the Army Medical Corps, who asked to be relieved as Director and to be appointed Field Director in order to give all his time to the field work of the Commission, which has been operating abroad, particularly in the Middle East. Colonel Bayne-Jones is also Assistant Director of the Division of Preventive Medicine, Office of the Surgeon General.

PERSONALS

Central States

WALTER H. HARTUNG, M.D.,* has been appointed Health Officer of Toledo, Ohio, according to the *Journal of the A.M.A.*, succeeding EARL E. KLEINSCHMIDT, M.D., DR.P.H.,* resigned. Dr. Hartung was formerly acting City

* Fellow A.P.H.A.
† Member A.P.H.A.

Health Director and State Health Officer. More recently he has been Director of the Medical Relief Bureau at the City Health Department. Dr. Kleinschmidt has joined the U. S. Public Health Service Reserve, Washington.

WILLIAM F. MAYES, M.D., has resigned as Director of the Division of Maternal and Child Health of the Kansas State Board of Health, Topeka, and has been appointed Regional Medical Consultant for the Children's Bureau, Washington. At present Dr. Mayes is located in the Kansas City District.

GEORGIA V. MILLS, M.D.,† of Detroit, Mich., has been appointed Deputy Health Officer of the Saginaw City Health Unit.

JOHN W. O'NEILL, M.D., of St. Charles, Mich., has been appointed Health Officer of District No. 5, including Newaygo, Lake, and Oceana Counties, Mich., succeeding ALBERT C. EDWARDS, M.D.† Dr. O'Neill's headquarters will be in White Cloud.

JEROME J. SIEVERS, M.D.,* has been appointed Chief of the Division of Communicable Diseases in the Illinois State Department of Health, Springfield, effective January 1. Dr. Sievers has been Assistant State Health Officer and succeeds the late JOHN J. MCSHANE, M.D.

LARS W. SWITZER, M.D.,† of Manistee, Mich., resigned as Director of the Manistee-Benzie County Health Department December 1 to become associated with General Motors Corporation, Bay City.

JAMES F. WILSON, M.D.,† Rogers City, Mich., Health Director of District No. 4, has been appointed to a similar position with the Manistee-Benzie County Health Department.

* Fellow A.P.H.A.
† Member A.P.H.A.

Eastern States

MARK D. DUBY, M.D., has been appointed Health Officer at Schuylerville, N. Y.

LALLA MARY COGGANS,* former supervisor at the Lobenstine School for Nurse Midwives in New York, N. Y., has been appointed to the position of regional consultant nurse for the Children's Bureau in the southwest area, with headquarters in New Orleans. Miss Coggans was formerly the maternal and child health consultant nurse in the state of Florida. She is a graduate of Teachers College, Columbia University, and the Lobenstine School for Nurse Midwives.

GRACE E. LUTMAN, M.D., M.P.H.,† has been appointed assistant in the Department of Epidemiology at the Harvard School of Public Health, Boston. Dr. Lutman received her degree in 1942 at Harvard. She will assist DR. W. LLOYD AYCOCK in giving the course in epidemiology.

MRS. HAROLD V. MILLIGAN of New York, N. Y., has been appointed National Commander of the Woman's Field Army of the American Society for the Control of Cancer, according to an announcement made by DR. CLARENCE C. LITTLE, the Managing Director. Mrs. Milligan is President of the National Council of Women and recently has served as Director of the Women's Division of the National Association of Manufacturers, New York.

TERRY S. MONTAGUE, M.D., of Gouverneur, N. Y., has been appointed Health Officer of Watertown to succeed GEORGE D. VAN DOREN, M.D., who has retired.

RUFUS S. REEVES, M.D., has been appointed Director of Health of Philadelphia, Pa., and MEYER SOLIS-COHEN, M.D., has been appointed Assistant Director.

HUGH H. SHAW, M.D., Health Officer of Utica, N. Y., according to the *Journal of the A.M.A.*, on January 1 entered his 25th year as Health Officer.

Southern States

REUBEN B. CALDWELL, Baldwyn, Miss., has been appointed a member of the State Board of Health to succeed JAMES W. LIPSCOMB, M.D., Columbus, President of the Board since 1932.

WILLIAM Y. GARRETT, M.D.,† of Eastville, Va., was recently appointed Health Officer of Newport News, succeeding DR. WILLARD W. GRIGGS, who resigned to enter private practice.

KENNETH M. LYNCH, M.D., who since 1940 has been Chairman of the South Carolina State Board of Health, has been appointed Dean of the Medical College of the State of South Carolina, Charleston, succeeding ROBERT WILSON, M.D., retired.

GEORGE N. MACDONELL, M.D.,† former Health Officer of Miami, Fla., has been appointed Chief of the Medical Service Division of the Dade County Defense Council. Dr. MacDonell succeeds DR. GERARD RAAP, Miami, who recently resigned because of ill health.

FRED MAYES, M.D.,† recently appointed Regional Medical Consultant of the Children's Bureau, Washington, has been assigned as Consultant for the Southeastern States with offices in New Orleans, La.

SHERMAN S. PINTO, M.D.,† New Orleans, La., Supervisor of the Industrial Hygiene Section of the Louisiana State Board of Health, has resigned to accept a commission in the Medical Corps of the U. S. Army.

DEAN W. ROBERTS, M.D., of Baltimore, Md., has been appointed Chief of the Bureau of Child Hygiene of the Maryland State Department of Health, Baltimore, succeeding EDWARD DAVENS, M.D., of Baltimore, who is in military service.

CYRUS M. SHIPP, M.D., of Bay St. Louis, Miss., Director of the Hancock County Health Department, was recently chosen President-elect of the Mississippi Public Health Association, and JOHN B. GRANT, McComb, was installed as President.

BRIGADIER GENERAL JAMES STEVENS SIMMONS,* U. S. Army, Chief of the Preventive Medicine Service, Office of the Surgeon General, U. S. Army, on December 22 had conferred upon him, by the University of Pennsylvania, the honorary degree of Doctor of Science.

CHARLES P. STEVICK, M.D.,† of Beaufort, N. C., Health Officer of Cartaret County, has been appointed Acting Director of the Division of Epidemiology of the State Board of Health with headquarters at Raleigh. It is reported that Dr. Stevick will continue in this position for the duration.

Western States

LILLIAN M. HALL, M.D., has recently been appointed Health Officer of Concord, Calif.

RUDOLPH R. LANG, M.D., Passed Assistant Surgeon, U. S. Public Health Service, was assigned as Health Officer of Deschutes County, Ore., succeeding FREDERICK P. ROGERS, M.D., who is entering military service.

L. J. LULL, M.D.,* who has been Director of Venereal Disease Control in the Colorado State Board of Health, Denver, has resigned to accept an appointment with the Idaho State Department of Public Health, Boise, as Director of the Division of Local Health Service, effective January 7.

LOUIE A. MAULDING, M.D., of Nyssa,

* Fellow A.P.H.A.
† Member A.P.H.A.

American Journal of Public Health
and THE NATION'S HEALTH

Volume 34 April, 1944 Number 4

Immunity in Human Subjects Artificially Infected with Influenza Virus, Type B*

THOMAS FRANCIS, JR., M.D., F.A.P.H.A., HAROLD E. PEARSON, M.D., JONAS E. SALK, M.D.,† AND PHILIP N. BROWN, M.D.

Department of Epidemiology and the Virus Laboratory, School of Public Health, University of Michigan, Ann Arbor, Mich., and the Ypsilanti State Hospital, Ypsilanti, Mich.

EPIDEMIOLOGICAL evidence indicates that immunity to influenza is acquired by the human subject, presumably as the result of infection, but its duration has not been clearly established. During the winter of 1942–1943 an effort was made to gain further information on this point by studying the reaction of a group of individuals to induced infection with influenza virus, Type B, and determining the response of the same subjects to the same virus four months later. The present report comprises the evidence obtained.

MATERIAL AND METHODS

Virus—The Lee strain [1] of influenza virus, Type B, was used throughout. The extra-embryonic fluid from infected hen's eggs, 48 hours after inoculation, was harvested and concentrated in physiological salt solution by the procedure of Francis and Salk.[2] For the first exposure, concentrate was used from the 20th and 21st egg passages after 8 passages in ferrets and 137 in mice. The material had been stored in the refrigerator at 4° C. for a month prior to use. In the second test similar material from the 34th and 35th egg passages was used after 7 to 16 days' storage at 4° C.

The titer of virus in the two lots of concentrate was determined by agglutination of chicken erythrocytes and by

* Presented at a Joint Session of the Epidemiology and Laboratory Sections of the American Public Health Association at the Seventy-second Annual Meeting in New York, N. Y., October 13, 1943.

† Fellow in Medical Sciences of the National Research Council.

NOTE: These investigations were aided through the Commission on Influenza, Board for the Investigation and Control of Influenza and other Epidemic Diseases in the Army, Preventive Medicine Division, Office of the Surgeon General, United States Army. This study was also aided by a grant from the International Health Division of the Rockefeller Foundation.

the intranasal infection of mice. Hemagglutinin titers were determined by a modification of the method described by Hirst.[3] Five-tenth ml. volumes of twofold dilutions in physiological salt solution of the fluid to be tested were mixed with equal volume of 0.25 per cent suspension of washed fowl erythrocytes. The test was allowed to stand at room temperature for 1½ hours, when all the cells had settled, and then read by viewing the pattern formed at the bottom of the tubes. The end point was considered to be the highest dilution of virus which completely agglutinated all the cells. The titer is expressed in terms of final dilution of virus, after addition of cell suspension.

The titers of the two lots of material are as follows:

		Mouse Infectivity		
	R C A	10^{-4}	10^{-5}	10^{-6}
Lot 1	20,000	7,7,9	9, ++++, +++	+ ± ±
Lot 2	12,800	6,6, ++++	++++, ++, ++	+ + ±

Numerals indicate day of death after inoculation
± to ++++ indicate different degrees of pulmonary consolidation at autopsy on 10th day

Method of Infection—The nebulizers used contain glass baffles against which the material to be sprayed is blown. The result is almost a dry mist which condenses on a cold surface with fine, uniform coating. The instruments were attached by rubber connections to a tank of compressed air and 10 lb. pressure was applied. Under these conditions the different nebulizers delivered 0.1 to 0.17 ml. per minute. Glass nasal adapters were attached to the dispensing end of each nebulizer and were inserted into the nostril. The spray was inspired by the subject through one nostril for 2½ minutes and then for the same time through the other nostril. In the process of spraying, the patient exhaled a large proportion of the material which settled as a fine cloud. The adapter was washed with antiseptic solution before use by another subject. The spraying was done in a small treatment room off the corridor leading to a large day room. After spraying, each subject was permitted to return to the large room where he mingled with the controls. Although the latter did not enter the treatment room, there was opportunity for atmospheric interchange between the spray room and the day room where both treated and control individuals congregated.

Subjects — The individuals participating in the clinical trial were residents of one ward of the Ypsilanti State Hospital, Ypsilanti, Mich. They were ambulatory males, many of them in the older age groups, who were confined to the ward except for a daily walk outdoors or occasional tonsorial expeditions. Since no preliminary information as to their serological levels was obtained, no selection on this basis occurred. There had been no evidence of heightened incidence of respiratory disease in the previous 8 months. All were carefully examined for signs of acute respiratory illness before being included in the group.

Clinical Observations—At the time of the first spray, records of rectal temperature were begun the day after inoculation and continued until the temperature reached normal. In many instances satisfactory stories of the individual's symptoms could not be obtained but attendants familiar with the customary behavior of the subjects were able to recognize significant modifications in this respect.

Previous to the second test, temperatures were taken *per os* for 2 days; thereafter rectal temperatures were

taken. In addition, from 9 men receiving virus a second time and from 9 receiving virus for the first time, leukocyte counts were obtained on the day before and the 2 days succeeding the spray.

Laboratory Studies—Venous blood was collected from each individual immediately before and 14 to 16 days after spraying. The sera were examined at one time for the titer of antibodies to the Lee strain of virus, using a modification of the agglutinin-inhibition test of Hirst.[4] The modified test * involves the use of a 0.25 per cent suspension of fowl erythrocytes in which the serum dilutions are made directly and the result is read by the sedimentation pattern obtained after complete settling at room temperature. To 0.5 ml. dilutions of the serum in the 0.25 per cent red cell suspension is added 0.5 ml. of virus dilution corresponding to twice the agglutinin titer, thus giving a mixture which contains one unit of hemagglutinin. The end point chosen is the last tube showing complete inhibition of agglutination and is expressed in terms of the final serum dilution, after the addition of virus. The lowest serum dilution tested in the routine test was 1:32, since significant changes in titer are usually well above this level. However, in a few instances lower dilutions were tested.

Throat washings were obtained 48 hours after inhalation from half the individuals sprayed in the first test but, owing to an accident, were rendered unsatisfactory for conclusive study. No virus was detected in samples examined for the presence of red cell agglutinins or tested by ferret inoculation. In the second experiment garglings were collected 24 hours after the spray from 19 receiving a second inoculation, from 10 receiving their first exposure and from 2 untreated controls. The samples were kept on dry ice until tested 10 days later. Each specimen was injected into the nostrils of 5 anesthetized mice which were reinoculated with sterile broth by the same route 4 days later. All animals were sacrificed on the 11th day and their lungs examined for virus lesions. A few samples were also examined for their capacity to agglutinate chicken's erythrocytes. The results are discussed in the text.

Dissemination of Virus—At the time of the second spraying experiment, 10 mice in a box of wire mesh were placed in the room where the inhalations were administered. Another set of 10 was placed on the floor in the ward where the men congregated after spraying. They were kept in these locations for 4 hours and then transported to the laboratory. Two days later, half the mice of each group were inoculated intranasally with sterile broth, and all were observed for signs of infection with influenza virus.

EXPERIMENTAL INFECTION OF HUMAN SUBJECTS WITH INFLUENZA VIRUS, TYPE B

Clinical Evidence—On November 28, 1942, 60 individuals inhabited the ward. Thirty were designated to serve as untreated controls; the remaining 30 were divided into three groups of 10. The first group was sprayed with virus which had been concentrated and then diluted to the strength of the original material; the second, with virus concentrated twofold; the third group received virus which had been concentrated tenfold. In the next 24 hours, 27 of the 30 individuals receiving the sprayed virus exhibited fevers of 100° F. or greater. In 20 instances the temperature was 101° F. or greater. The data presented in Table 1 indicate that the severity of febrile reaction was somewhat related to the amount of virus received. Thus, 6 of 10 receiving the smallest dose had temperatures of

* Details of the procedure are soon to be published.

TABLE 1

Febrile Response to Spray with Different Doses of Influenza Virus, Type B

Group	Dose	Maximal Temperature (per rectum) <100° F.	100°–100.9° F.	101°–101.9° F.	102°+ F.
1	Unconc.	1	5	1	3
2	2 x Conc.	1	2	3	4
3	10 x Conc.	1	0	2	7
	Total	3	7	6	14

less than 101° F. whereas, 9 of the 10 given the largest concentration of virus had fever of 101° F. or greater. The temperatures of those receiving the intermediate dose were more widely distributed.

From 14 subjects in the series there were either no complaints or information was not obtainable. Among the remaining 16 the following symptoms were noted:

Chills or chilliness	14
Loss of appetite	9
Nausea	5
Malaise	4
Headache	2
Nausea and vomiting	2
Body aches	1

Seven of the patients took to bed. It should be observed that coryza, sore throat, and productive cough were essentially absent.

Physical examination revealed little. No evidence of pulmonary involvement was noted.

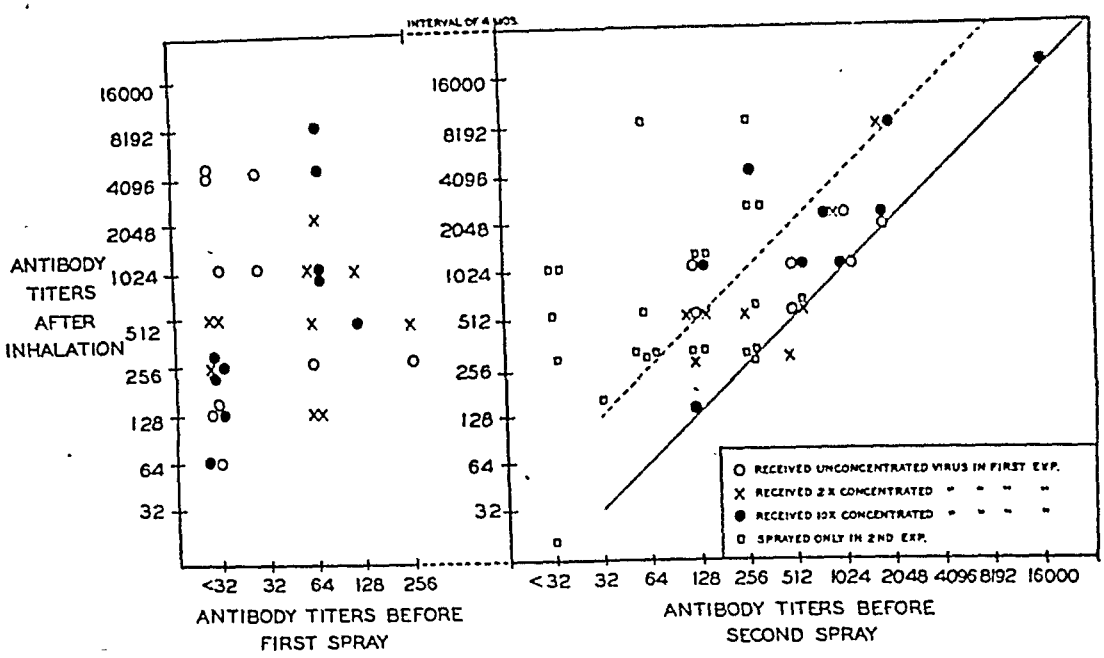
The period of illness was brief. In all but 6 instances the temperature reached normal on the 2nd day; in 5 cases on the 3rd day and in 1 case on the 4th day. With the subsidence of fever, symptoms disappeared and the patients rapidly returned to their customary states of activity and appetite. In general, the symptoms seemed to be somewhat proportionate to the febrile reaction but 2 of the individuals who had no febrile reaction were among those with most definite complaints. Patients with various degrees of illness, apart from fever, were divided in all groups though a tendency to more pronounced symptomatology was observed in those with the larger doses of virus.

Antibody Titers—The serological responses measured by the inhibition of erythrocytic agglutination are shown in the tables and charts. In 26 of the 30 individuals a fourfold or greater rise in titer of antibodies was noted; two of the four failures occurred in the only 2 subjects with initial titers as high as 256. At the beginning of the experiment titers greater than 64 occurred in only 4 instances, while 2 weeks later only 2 individuals had titers as low as 64 (Chart 1). There was no discernible relation between the height of fever or the dosage of virus and antibody response. Those with normal temperatures and those with the milder degrees of fever after the weakest dose of virus responded equally as well as those who had the highest temperatures after the largest doses of virus. The mean titers before and after spraying were 48 and 1,516, respectively, in those receiving the unconcentrated virus; 46 and 1,581 in those receiving virus concentrated tenfold; 75 and 659 in those receiving the twice concentrated material. In 11 individuals with temperatures of 101° or less, the mean titer was 54 before spraying and 1,059 afterward, while the mean titers in 19 individuals with temperatures of 101.8 or greater were 56 and 1,336, before and after spraying, respectively.

The distribution of titers at the onset was scarcely diffuse enough to gain a satisfactory impression of relation be-

CHART 1

ANTIBODY TITERS BEFORE AND AFTER INHALATION OF TYPE B INFLUENZA VIRUS



tween antibody levels and clinical response. Moreover, three different concentrations of virus were employed. Nevertheless, all ranges of reaction were observed at any one initial level of antibodies (Chart 2). For example, of the 14 individuals with the lowest measured titer of less than 32, the recorded maximal temperatures varied from normal to 103.6°. Within the limited scale available the antibody level at the onset of the experiment appeared to have little relation to the extent of the fever which ensued.

Contacts—Among the 30 individuals selected as untreated controls, temperatures were not recorded but no recognizable signs of illness were noted. Nevertheless, serological studies revealed that 11 of them had developed in the period of 14 days an increase to at least four times the original antibody titer so as to indicate that infection had occurred. Three others had twofold rises in titer (Table 2).

TABLE 2

Positive Serological Responses among Contact Controls—First Series

Subjects	*Antibody Titer—Before*	*Antibody Titer—After*
C2 ac	64	>1,024
C5 jf	64	256
C6 bg	64	512
C4 tl	16	64
C10 pm	16	64
C12 cr	64	1,024
C15 rs	<32	128
C29 wt	<16	64
C22 ow	32	2,048
C24 sw	128	2,048
C25 jw	16	64
Dr. hpl	64	1,024

One physician who had watched the spraying procedure experienced generalized aching, pharyngeal irritation, nausea, and a temperature of 99.4° the day following exposure. He subsequently developed a high antibody titer.

The observations clearly indicate that the virus became distributed in the environment so that individuals occupying the quarters in which the spraying was done and mingling with subjects purposely given the spray, underwent in-

fection which was not detected by ordinary observation. Here again infection was not limited to contacts with the least antibody titers but was distributed over the range present in the control group.

SUMMARY

As a result of intranasal spray with influenza virus, Type B, a mild illness ensued. The disease was characterized by an incubation period of 10 to 24 hours; the onset was most commonly accompanied by chilly sensations, aching, loss of appetite, and nausea. The absence of respiratory symptoms or signs was notable. In one-fourth of the subjects the illness was sufficiently severe to put the individual to bed. Twenty-seven of 30 subjects had fever of 100° or greater in the first 24 hours; two-thirds had temperatures of 101° or higher. In the majority, signs and symptoms of illness had disappeared by the 2nd day after inoculation. The height of fever appeared to be more closely related to the amount of virus received than to any single level of antibodies present. All but 4 subjects had at least fourfold rises in antibody titer following the inhalation irrespective of the amount of virus received or the severity of the febrile reaction. Of 30 untreated controls, 11 developed significant serological changes indicating infection incurred while residing in the same quarters.

REINFECTION

In the latter part of March, 1943, 65 subjects on the same ward were available for study. Three groups were formed. The first consisted of 24 of the 30 subjects who had received virus in November. The second group comprised 10 individuals who had served as untreated controls in the first experiment and 13 new arrivals on the ward. A third group made up of 2 individuals previously sprayed, 9 of the earlier controls, and 7 new arrivals, represented untreated controls. Temperatures were taken by mouth on the 2 days preceding the spray and subsequently by the rectal route. Efforts to gain information of clinical symptoms and signs were intensified. On March 29, 1943, each of the 47 individuals in the first two groups received an intranasal spray of the Lee strain of Type B influenza virus, concentrated tenfold, for 5 minutes.

Clinical Response — Symptoms and fever first occurred within 12 hours of the exposure and in 24 hours the effect was at its height. Essentially the same symptoms were noted by those given virus the second time and by controls receiving their first inoculation. They were most prominent again in individuals with highest fevers.

	Resprayed	*Sprayed Controls*
Chilly	8	7
In bed	4	8
Headache	4	7
Malaise	3	2
Anorexia	2	3
Cough	2	2
Bodily aches	1	3
Nausea	1	2
Dizzy	0	3
Sore Throat	0	3
Runny Nose	0	1
Vomiting	0	1

Thirteen of the reinoculated and 14 of the sprayed controls had definite symptoms; 4 and 8, respectively, were in bed. In most instances the illness subsided 24 to 36 hours after inhalation, but in a few cases temperatures remained elevated until the 3rd day.

Among the 24 individuals tested for immunity by reinoculation of virus, 21 developed temperatures of 100° or higher, as did all 23 of those sprayed for the first time. However, 19 (82.6 per cent) of the latter developed fever of 101° or greater while only 9 (37.5 per cent) of the reinoculated group reached that level (Table 3, Chart 2). The rapidity with which fever developed

CHART 2

RELATION OF ANTIBODY TITER AND FEBRILE RESPONSE TO TYPE B INFLUENZA VIRUS

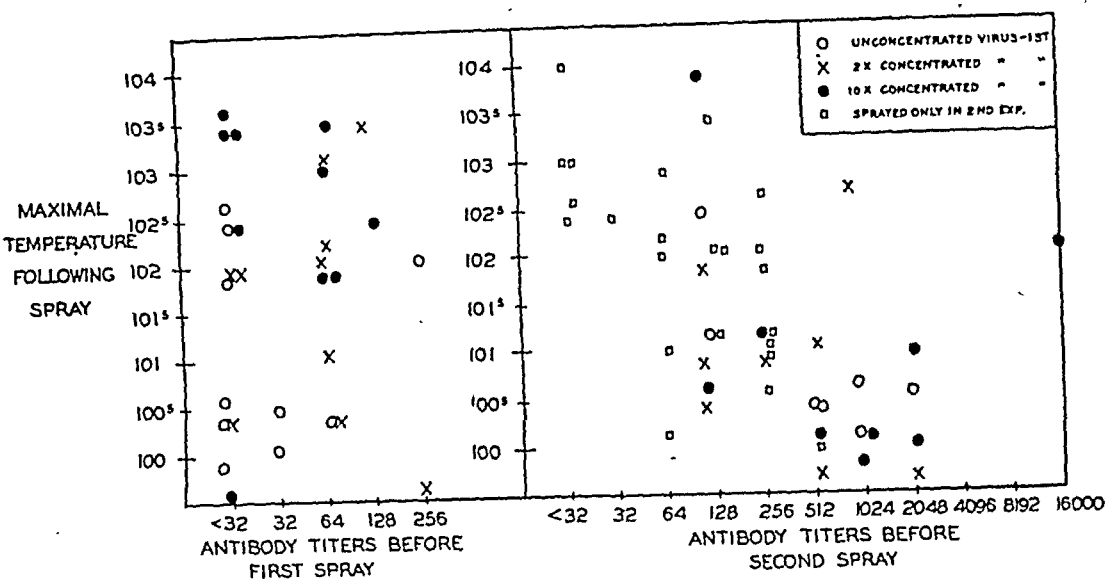


TABLE 3

Febrile Responses of Subjects Resprayed with Influenza Virus, Type B, and Controls

Group	No.	Maximal Temperature (per rectum) <100° F.	100°–100.9° F.	101°–101.9° F.	102°+ F.
Resprayed	24	3	12	5	4
Sprayed Controls	23	0	4	5	14
Contact Controls	18	15	2	1	0

and declined was essentially the same in both groups.

No sharp change in the leukocyte count occurred. The mean count of individuals before spraying was 12,300 and on the 1st and 2nd days after spraying was 11,300 and 8,900, respectively. No difference was observed in the trends exhibited by those receiving a first or second inhalation of the virus.

It becomes quite evident that 4 months after infection with influenza virus, Type B, inhalation of the same virus induced in the same group of individuals illness clinically similar to that which followed the first exposure. The majority of those retested had lower temperatures and symptoms were generally less pronounced than in control subjects receiving their first inhalation of virus.

Serological Response — Prior to the original spraying of the group the titers of antibody to influenza virus, Type B, were preponderantly low. In consequence of that experience, much higher levels were reached and, to a great extent, maintained through the interval of 3½ months between the termination of the first study period and the beginning of the second. Moderate shifts occurred, however. In 8 instances the titers decreased within a range which might be anticipated with the lapse of time. Increases which were noted in 12 instances are probably attributable to continued accessions of antibody beyond the time at which the second sample was obtained rather than to deterioration of the earlier samples of serum during the period of storage. This was evidenced by comparing results of tests conducted in December with the first two specimens of serum

TABLE 4

Changes in Antibody Titer in Interval Between Studies

	Decreased			Increased		
Unchanged	*2 x*	*4 x*	*8 x*	*2 x*	*4 x*	*8 x*
6	3	4	1	4	5	3

and those in April which involved all four specimens.

Except for one value of 16,000 the titers of the group immediately before reinoculation ranged evenly from 128 to 2,048 with a mean of 848 and a median of 512. The titers of the con-

TABLE 5

Serological Responses to First and Second Inoculations of Influenza

Antibody Titer Before Inhalation	*Sprayed—First Series*				*Resprayed*				*Sprayed Controls*			
		Increase in Titer				*Increase in Titer*				*Increase in Titer*		
	No.	*0*	*2 x*	*4 x +*	*No.*	*0*	*2 x*	*4 x +*	*No.*	*0*	*2 x*	*4 x +*
64 or less	21	1	1	19	..	..	..	..	11	1	0	10
128–256	3	1	1	1	9	1	2	6	11	3	3	5
512–1,024	0	..	..	..	10	5	5	0	1	1	0	0
2,048+	0	..	..	..	5	3	0	2	..	..	..	..
Total	24	2	2	20	24	9	7	8	23	5	3	15

TABLE 6

Summary of Clinical and Serological Responses to First and Second Inoculations of Type B Influenza Virus

Subject	*Original Dose*	*Severity of Symptoms*		*Maximal Temperature*			*Antibody Titers*	
		1st	*2nd*	*1st*	*2nd*	*Diff. 1–2*	*1st*	*2nd*
9 th	U	+++	0	99.8	100.2	+0.4	<32/4,096	1,024/2,048
11 gb	2 x	+++	+++	103.2	102.6	−0.6	64/1,024	1,024/2,048
22 ak	10 x	+++	0	103.6	100.2	−3.4	<32/128	512/1,024
26 jp	10 x	+++	++	103.4	101.2	−2.2	<32/64	256/4,096
29 cs	10 x	+++	+++	103.4	103.8	+0.4	<32/256	128/1,024
14 lb	2 x	++	++	101.8	100.4	−1.4	<32/512	128/512
23 al	10 x	++	0	101.8	100.2	−1.6	64/4,096	1,024/2,048
25 wo	10 x	++	++	102.8	101.0	−1.8	<32/256	2,048/2,048
30 ws	10 x	++	+	98.6	100.6	+1.0	32/256	128/128
12 db	2 x	+	++	101.0	100.8	−0.2	64/128	128/512
16 ld	2 x	+	+	100.4	100.8	+0.4	<32/512	256/512
17 cd	2 x	+	0	98.6	99.6		256/512	512/512
8 jg	U	+	+++	100.4	102.4	+2.0	<32/128	128/1,024
21 fj	10 x	+	+	103.4	100.0	−3.4	64/8,192	2,048/8,192
4 ec	U	0	0	100.4	100.6	+0.2	32/1,024	2,048/2,048
6 eb	U	0	0	100.0	100.4	+0.4	32/4,096	512/1,024
7 hf	U	0	0	100.4	100.6	+0.2	64/256	1,024/1,024
13 jb	2 x	0	+++	102.0	101.8	−0.2	64/64	128/256
15 tc	2 x	0	0	100.4	101.0	+0.6	64/512	512/256
1 rb	U	NH	+	102.0	100.4	−1.6	256/256	512/512
2 rb	U	NH	+++	102.6	101.2	−1.4	<32/64	128/512
19 jh	2 x	NH	NH	101.8	99.6	−2.2	<32/256	2,048/8,192
27 js	10 x	NH	NH	102.4	102.0	−0.2	128/512	16,000/16,000
28 vs	10 x	NH	NH	101.8	99.8	−2.0	64/1,024	1,024/1,024
3 wb	U	NH		100.6			<32/128	
5 tc	U	+		102.4			<32/1,024	
10 wh	U	0		101.8			<32/4,096	
18 bf	2 x	+++		103.4			128/1,024	
20 hh	2 x	+++		102.2			64/2,048	
24 cn	10 x	0		103.0			64/1,024	

Symptoms: 0 to +++ = increasing severity of constitutional reaction.
NH = no information from patient.

Antibody titers: Numerator = titer before inoculation.
Denominator = titer after inoculation.

U = inhalation of virus—unconcentrated.
2 x = inhalation of virus—concentrated twofold.
10 x = Inhalation of virus—concentrated tenfold.

trols who were to receive the spraying for the first time had a mean of 141 and a median of 128. The responses of the two groups are seen in Chart 1 and are tabulated (Tables 5, 6, 7).

TABLE 7

Responses Among Controls Sprayed in Immunity Test

Subject	Maximal Temperature	Symptoms	Antibody Response
C8 ck	104.0	+++	<32/1,024
C36 eg	103.4	+++	128/1,024
C32 wb	103.0	+++	<32/1.024
C42 wn	103.0	0	16/16
C19 ct	102.8	+	64/256
C41 hm	102.6	+++	<32/256
C23 jw	102.6	0	256/8,192
C43 ns	102.4	+++	<32/512
C37 jh	102.4	0	32/128
C33 jc	102.2	0	64/8,192
C31 db	102.0	+++	64/256
C38 lh	102.0	+++	256/256
C14 js	102.0	+++	128/256
C40 jm	102.0	+	128/256
C6 bg	101.8	+	256/2,048
C11 šn	101.2	++	128/1,024
C5 jf	101.2	0	256/256
C18 pt	101.0	++	64/256
C15 js	101.0	0	256/512
C9 dMc	100.8	++	256/256
C35 ce	100.6	0	256/2,048
C34 ed	100.2	0	64/512
C39 jk	100.0	0	512/512

Symptoms: 0 to +++ = increasing severity of constitutional reaction

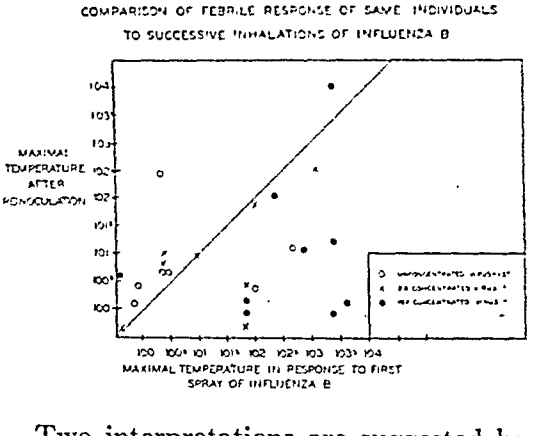
Antibody titers: Numerator = titer before inoculation. Denominator = titer after inoculation.

Following the inhalation of virus, 8 of the experienced and 15 of the new subjects developed significant increases in titer. The increment of increase, however, was much greater in the controls whose mean titer rose from 141 to 1,260 (median 512) while the rise in resprayed individuals was from a mean titer of 848 to one of 1,776 (median 1,024). Significant serological responses in both groups were most common in those with the lower antibody levels and least frequent in subjects with high titers.

COMPARISON OF RESPONSE OF SAME INDIVIDUALS TO FIRST AND SECOND EXPOSURES

Fever—Of the 24 individuals who received the two inhalations of virus, 21 developed fever of 100° or more each time; only 1 remained below that point in both tests. In 10 instances the maximal temperature following the second exposure was within 0.5° F. of the height reached in the primary attack; the majority of these individuals were those who, following the smaller amounts of virus, had the milder fevers originally (Chart 4). One of them, however, with fever of 103.4° in the primary episode responded with 103.8° to the second inoculation (Chart 5). On the other hand, of the 14 cases who exhibited fever higher than 101° on the first exposure, 10 showed decidedly lower temperatures, with a mean decline of 1.5° F., in the second test (Chart 6). In only 3 instances was the second fever significantly higher than the first (Chart 3, Table 6).

CHART 3



Two interpretations are suggested by the results. The fact that primarily those with the highest original fevers exhibited reduced temperatures following reinoculation (Chart 4) might be considered to indicate that they alone had profited from the earlier experience and that the reactive state of the remaining individuals had been essentially unaltered. Since, however, most of the subjects with fever of about the same extent in both tests were those who received the smaller doses of virus the first time, it may be inferred that the milder response to the first inhalation of virus had been just as beneficial in

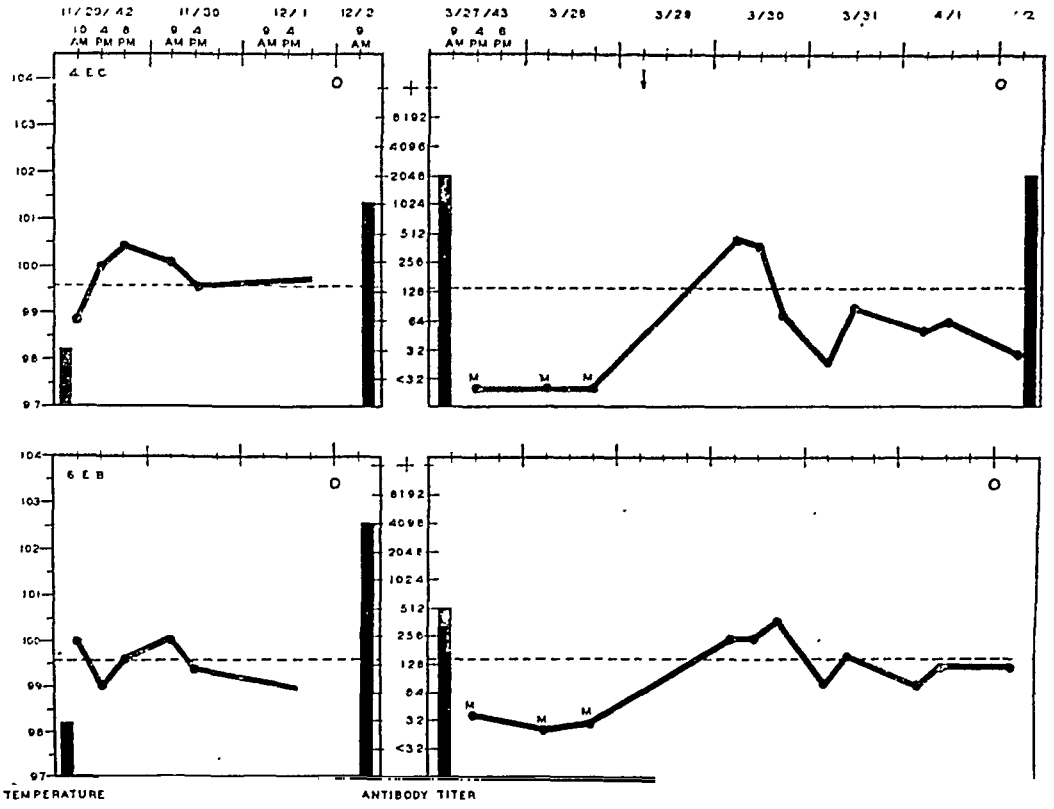


CHART 4—Subjects 4 and 6 received unconcentrated virus in November. Temperature was low, no symptoms were noted but sharp rises in antibody occurred. Four months later virus concentrated tenfold was administered. The second clinical response was similar to the first but no further increase in antibodies took place.

The left half of each chart represents the original febrile response beginning the day after inoculation; the right half the response to reinoculation. The vertical columns indicate antibody titers immediately before and 2 weeks after inoculation. Symbols in upper right corners indicate severity of symptoms. (See Table 6). *M* signifies oral temperatures.

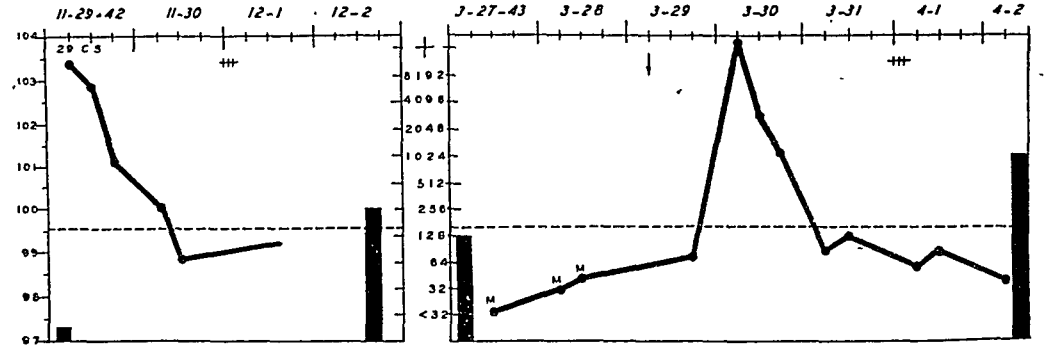


CHART 5—Illness was among the most marked of the group after each exposure to virus concentrated tenfold. Significant antibody increases occurred both times (Subject 29).

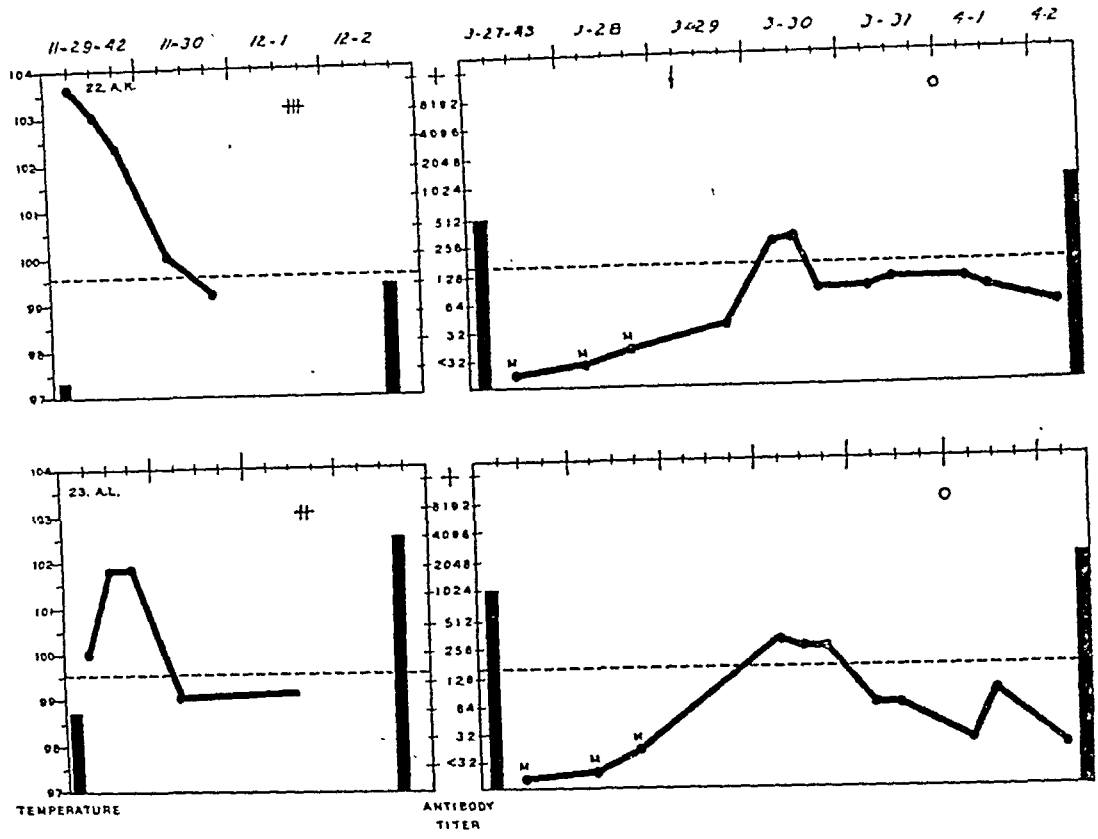


CHART 6—The charts of subjects 22 and 23, who had sharp febrile reactions, pronounced symptoms, and significant antibody responses to the first inhalation of virus on November 28, 1942. Second inoculation on March 29, 1943, was followed by markedly reduced temperatures and symptomatology.

limiting the second response of these individuals as was the more severe reaction in reducing the height of fever in the other group. Had this not been the case higher temperatures, equivalent to those of the controls, might have occurred (Chart 3).

Symptoms—Although the symptomatic evidence is of limited value, definite complaints were obtained from 14 of the group after the first spray and from 13 of them following the second. A comparison of the complaints of the same individuals in the two experiences revealed the following:

No symptoms either test	4
Decreased severity in second test	6
Increased severity in second test	5
Same severity both tests	6
No information either test	3

In both periods symptoms tended to be most severe among those with the highest fevers. In the individuals exhibiting the more marked symptoms after the second exposure, however, only 1 showed higher fever than in the original test. Diminished febrile reactions to the second spray, therefore, were not consistently accompanied by a reduction in symptoms, nor was the reaction to reinoculation clearly referable to the severity of initial response. The more marked symptoms in the second test followed just as commonly after a severe as after a mild primary response (Table 6).

Serology—The individuals subjected to reinoculation had considerably higher titers of antibody at that time than were observed at the time of their original inoculation. In general, they were less responsive, serologically, to

the second inhalation than to the first. The mean titers before and after the first exposure were 65 and 1,180; before and after the second, 848 and 1,776. Whereas, originally 20 of the 24 had antibody rises to four times or more the initial titer, and 2, twofold; after the second spray 7 showed twofold increases and only 8 had a fourfold or greater increase (Tables 5 and 6, Chart 1). Although these 8 individuals had exhibited significant responses to the first inoculation, the medians of their titers preceding and following the first infection were low, 16 and 96, respectively. At the time of the immunity test, 5 of them had titers of 128; the lowest level encountered in the retested series. It is well to emphasize that they belonged to the group with most definite symptoms and fever in each test. Despite the sharp rise in antibodies from the original level these subjects were again clearly susceptible to reinoculation with serological and clinical responses to second inoculation in many respects parallel to the first.

Briefly, inhalation of Type B influenza virus 4 months after exposure to the same virus induced again febrile response in the majority of the group. In general, temperatures were either lower or about the same level as those exhibited in the first attack. When symptoms could be obtained there was no relation demonstrable between their severity in the first instance and the response to the second attack (Chart 7).

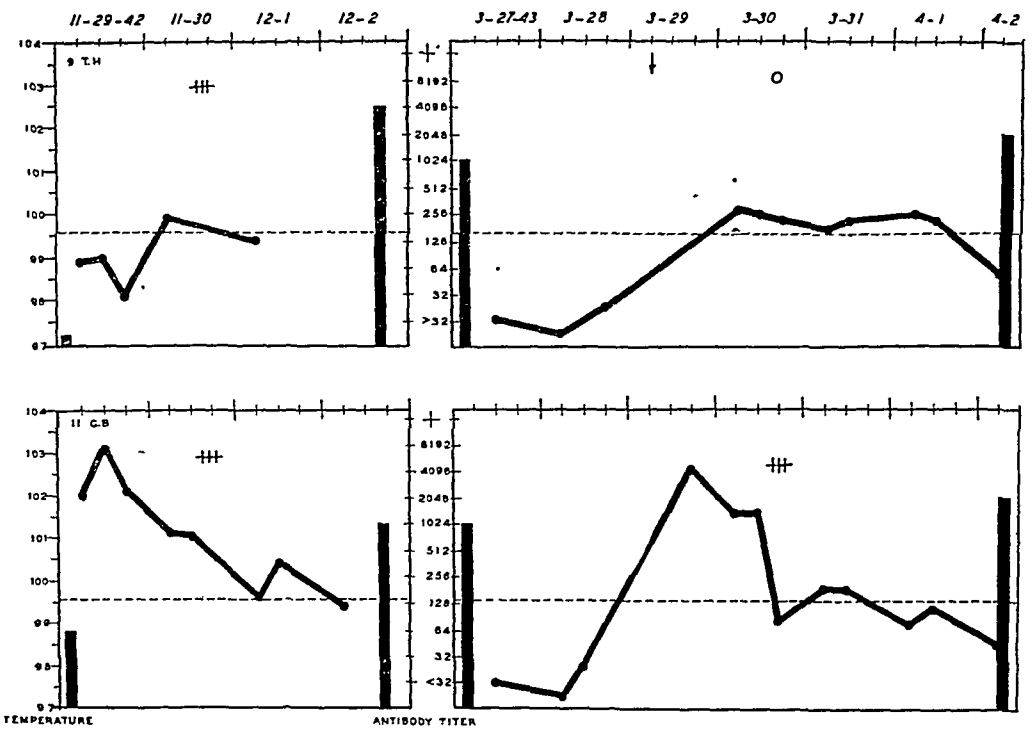


CHART 7—*Subject 9.* Illustrates the presence of pronounced symptoms and sharp antibody response with minimal febrile reaction following inhalation of unconcentrated virus. Test for immunity with concentrated virus elicited no symptoms, slight fever and no further rise in antibody.

Subject 11. Despite well marked fever, symptoms and antibody response to the first inoculation, the severity of the second clinical reaction was undiminished. The antibody titer was not significantly affected.

Although antibody titers were decidedly higher at the time of reëxposure than originally, one-third of the subjects, comprising largely those with the most severe second illness, responded with significant serological reactions again. The major effect of previous infection appeared, therefore, to be a reduction in severity of the second attack.

PERSISTENCE OF VIRUS

No virus was recovered from the throat washings obtained from 29 sprayed subjects 24 hours after inhalation of the virus. Each specimen was tested in mice with the appearance of pulmonary lesions taken to indicate infection. With five specimens attempts were made to adsorb virus from the washings with chicken erythrocytes and concentrate it by elution. No significant agglutination of red cells by the eluate was noted. The failure to find virus under these conditions was somewhat surprising in view of the short period elapsing after the spray.

On the other hand, that virus was in the air was demonstrated by the infection of mice exposed during the spraying procedure. The 5 mice which were given a stimulating intranasal inoculation of broth following exposure in the spray room, died of influenza virus infection; 2 of the remaining 5 died and the other had extensive pulmonary lesions when autopsied on the 10th day. All the mice exposed in the large day room occupied by the patients survived for the 10 day period of observation but had extensive pulmonary lesions. Influenza virus, Type B, was identified. These results show that the virus was distributed in the atmosphere by the spray itself and probably for a limited period, at least, by the infected subjects. It is of interest, however, that in this second series only 2 of the 18 contact controls gave serological evidence of having been infected through the environment in contrast to 11 instances in the first contact group.

RELATION OF CLINICAL RESPONSE TO SEROLOGICAL STATUS

In the first experiment, the use of three different strengths of virus apparently accounted for certain variations in clinical response. Partly because of these conditions, no intimate relation between symptoms or fever and the initial or subsequent antibody titer was evident. For the second spraying, virus concentrated tenfold was used throughout and the influence of other factors can be considered on the basis of uniform dosage.

In Chart 2 and Table 8 it is seen that when compared with themselves in the first test or with the controls for the second test, individuals undergoing their second experience had in general the higher antibody titers and lower temperatures. Moreover, the controls with lowest antibody titers presented a preponderance of high temperatures. In the intermediate range of titers (128–256) both controls and reinoculated subjects were found. The temperatures of individuals in this antibody zone were more widely distributed than those in the higher or lower antibody levels. But because of the limited numbers and since practically all the titers above 256 belong to individuals previously inoculated while the low titers of 64 or less are limited to those who had not undergone recent infection, no strict conclusion can be drawn. Nevertheless, a comparison of the responses of the resprayed and the controls of the second series does suggest a trend of decreasing severity of fever as antibody levels rise. Only 4 of the 24 reëxposed subjects had temperatures of 102° or more, while 14 of the 23 controls reached that level. Totalling all groups it is seen that temperatures of 101° or more occurred in 22 of the 32 (68.7 per cent) with titers of 64 or less, in 16 of 23 (69.5 per cent)

TABLE 8

Relation of Febrile Response to Influenza B and Antibody Titer

Antibody Titer Prior to Inoculation	Maximal Temperature: Sprayed—1st				Resprayed				Sprayed Controls—2nd				Totals			
	<100	100–100.9	101–101.9	102+	<100	100–100.9	101–101.9	102+	<100	100–100.9	101–101.9	102+	<100	100–100.9	101–101.9	102+
<32	2	2	2	5	..	..	..	..	..	..	0	5	2	2	2	10
32–64	..	5	2	3	..	..	..	..	..	1	1	4	0	6	3	7
128–256	1	..	0	2	..	4	3	2	..	2	4	5	1	6	7	9
512–1,024	..	..	..	..	2	6	1	1	..	1	..	..	2	7	1	1
2,048+	..	..	..	..	1	2	1	1	..	..	..	..	1	2	1	1
Totals	3	7	4	10	3	12	5	4	0	4	5	14	6	23	14	27

with titers of 128 and 256, in 4 of 16 (25 per cent) with titers of 512 or more.

The tendency for symptoms to be proportionate to fever was noted in both periods of observation of the original group and in the sprayed controls. At the time of the respraying, 9 of the 13 reinoculated subjects who presented positive signs or symptoms resided in the antibody levels of 128 or 256, the lowest of the group. This suggests again an association between antibody titers and severity of disease.

The 9 reinoculated individuals (2, 8, 11, 12, 13, 14, 25, 26, 29) with most definite symptoms (++ or +++) included 7 of the 9 with fever of 101° or greater, 7 of the 9 with lowest antibody titers (128 or 256), and among this 7 were 6 of the 8 who showed a fourfold or greater rise in antibodies following the second inoculation. In these instances, involving individuals with the lowest titers of the group, fever, symptoms, and antibody response combined to give the most complete evidence of infection (Chart 5). Of the 8 reinoculated subjects without complaints only 1 had fever as high as 101°, their antibody titers were all 512 or greater, and none showed a significant increase in antibodies. The suggestion arises that under the conditions of the present experiment significant rises in antibody are most common in those with the most definite clinical signs of disease. On the other hand, the absence of a fourfold increase in antibodies cannot be interpreted as freedom from infection when fever occurs in the presence of high antibody titers since they are less readily affected by additional antigenic stimuli (Chart 7, subject 11).

Among the sprayed controls a broad relation was also found between height of fever and the extent of antibody response. Of 10 with temperatures greater than 102°, all but 1 showed a fourfold or higher rise in antibody and 6 had more than an eightfold increase; of 13 with 102° or less only 6 had an increase of fourfold or more and none had more than eightfold increase. It should be recalled, however, that no such correlation was found in the original group receiving the different doses of virus.

In summary, the relation between the height of circulating antibodies and clinical response to infection is not clearly demonstrable in the limited data available from the present study. There exists a tendency, most evident in the previously infected, for high antibody titers to be associated with the lower temperatures. Among the controls sprayed in the second experiment there was also a tendency toward an inverse relation between the severity of reaction and the level of circulating antibody. On the other hand, all degrees of reaction were found at any given antibody level.

The results among the reinoculated individuals and their controls at the time suggest that the most prominent serological responses to infection occur in subjects with the most marked clinical reaction, although this was not noted among the individuals sprayed with different doses of virus in the first experiment. The fact remains that despite a rather uniform increase in antibody to levels beyond those encountered in the group originally, reinoculation 4 months later caused clinical evidence of infection in a high proportion of the 24 subjects a second time and in 8 individuals a second significant increase in antibody titer took place.

SPECIFICITY OF FEBRILE REACTIONS

Since the great majority of subjects in all three sprayed series, irrespective of dose or experience, had fever of 100° or more, it is apparent that if the lower fevers represent disease, infection 4 months earlier did not prevent reinfection. Although the serological responses and the presence of symptoms in afebrile subjects indicate that the mild fevers were associated with infection, the possibility that certain of the lower temperatures in the reinoculated group might be nonspecific remained. In order to study the question a series of individuals were sprayed with virus inactivated by ultra-violet irradiation.

Concentrated virus of the same lot as that used in the second test was irradiated with ultra-violet light for sufficient time to inactivate the virus as measured by loss of infectivity for mice and chick embryos. Eight subjects not previously studied and 4 who had been sprayed with active virus 4 months earlier were then given inhalations of the inactive virus for 5 minutes. Temperatures were taken before and after spraying and serological tests were made with serum obtained before and 2 weeks after the inhalation. One of the previously untreated subjects developed chilly sensations and a temperature of 102° the following day but an antibody titer of 32 remained unchanged. It seems likely that this represented an incidental illness. One of the 4 individuals sprayed earlier with active virus had a temperature of 100.4° on the 3rd day after spraying. The tardiness of this fever in comparison with the rapidity with which fever follows active virus indicates that it was not of the same nature. No other reactions were observed. None of the individuals showed a fourfold rise of antibodies as a result of spraying with inactivated virus.

The evidence clearly indicates that the elevated temperatures observed in the studies with active virus are not related to nonspecific factors associated with the spraying and that allergic reactions to egg fluid or the virus played no rôle in the symptomatic or febrile responses to the inhalation of active virus. Subsequent studies have added ample confirmation of this conclusion.

DISCUSSION

The inhalation of nebulized influenza virus, Type B, by human subjects produced an illness closely resembling that seen in the milder outbreaks of the natural disease. The course of the disease was brief and the severity varied among individuals, depending to some extent upon the concentration of virus administered. It is noteworthy that in most instances the incubation period was 12 to 24 hours, that temperatures greater than 102° F. were common, and that respiratory signs and symptoms were conspicuously infrequent while constitutional symptoms were predominant. No complications ensued.

Four months after the induction of clinical influenza, reëxposure of the same group of individuals to the same virus was again followed by clinical disease evidenced in fever, symptoms, and

serological reactions. Nine of them had temperatures of 101° or greater and 8 exhibited a second significant rise in antibodies. That a state of increased resistance had persisted over this period was seen, however, by the reduced severity of the second response in comparison with the primary reactions of the same subjects or controls. In estimating the degree of resistance, the significance of the febrile reactions among the reinoculated individuals must be appraised. The milder febrile reactions in the original group were largely limited to those receiving the smaller concentrations of virus. In the second instance, where one preparation of virus was used throughout, they were essentially exhibited by the reinoculated subjects in contrast to the inoculated controls. The infrequent and irrelevant fevers in untreated controls and in those sprayed with inactive virus strongly suggest that the temperatures of 100° to 100.9° in the reinoculated subjects represent, in the main, reactions to the inhalation of active virus rather than allergic or nonspecific responses to the sprayed material. This is further supported by the presence, as in subjects 12, 14, and 21, of symptoms and further increases in antibody titer comparable to those of individuals with higher fevers. Hence, it must be concluded that few of the previously infected subjects were wholly refractory to reinfection. On the other hand, the fact that 15 of the 24 reinoculated had temperatures below 101° while 19 of the 23 controls had temperatures of 101° or more indicates that the earlier infection had conferred a significant degree of resistance upon a majority of the individuals involved. Had the infection been milder the effect would probably have been enhanced, but this would require the employment of much larger numbers of individuals than seems feasible at the present time.

Information as to the influence of circulating antibodies upon the response to infection is not readily drawn from the present data. Combining the results from all groups it was found that 69 per cent of those with titers below 512, and 16 per cent of those with titers of 512 or more developed temperatures of 101° or higher. However, the low titers of antibody were preponderant among those receiving their first inoculation while those who had been previously infected possessed uniformly the higher titers. The recently experienced subjects with high titers had, in general, lesser febrile reactions than the inexperienced with low titers. On the other hand, the persistence of an increased titer of circulating antibodies from the first infection did not necessarily prevent the development of clinical disease a second time. Thus, although resistance and circulating antibodies were enhanced by infection, the evidence does not permit any conclusion as to a causal relationship. As has been shown elsewhere, an increase in circulating antibodies following infection [5] or vaccination [6] results in an increased neutralizing capacity of the nasal secretions. In these terms, circulating antibodies serve more as an index of the activity of the local protective mechanisms than representing the actual agency of resistance. This concept would appear clearly applicable under the conditions of the present study.

It may be objected that the procedures adopted constitute too severe a test of the immune state and that the respiratory tract is much more intensely exposed to the virus than is the case in natural infection. This implies that under natural conditions a minute amount of virus enters the upper respiratory tract during a brief period of exposure. On the other hand, recent studies of air-borne infection call attention to the fact that, in closed spaces, contamination of the air by infected individuals constitutes an opportunity

for prolonged exposure and permeation of the respiratory tract with much larger amounts of virus than mere contact would afford. The serological evidence among 11 of 30 contact controls in the first experiment demonstrates that the virus employed in the present investigation also produced infection after entering the respiratory tract by the more physiological method of normal respiration in an infected atmosphere. Although approximately 0.5 ml. of the virus was delivered to each individual the actual amount retained is not known because much of it was promptly exhaled. Moreover, the differences in response among the groups receiving different concentrations of virus suggests that the amount was not greatly in excess of that needed for adequate clinical reaction. The frequency of infection was clearly heightened by the manner of observation, detecting brief and mild responses which under conditions of normal activity would not have been noted. The incidence of clinical disease in an epidemic is related to the care with which a population is observed and the infectiousness of the prevalent strain. The fact that the incidence of influenza, Type B, has been low in recent epidemics may well reflect a need for relatively large doses of the current strains in order to produce the disease naturally as well as experimentally. For the purposes of this investigation it has been advantageous to employ amounts of virus sufficient to compensate for natural defects in the strain and yet to permit a demonstration of the differences in response of individual subjects. Under other conditions the same procedures have clearly demonstrated firm immunity in groups under investigation.

Bull and Burnet [7] have recently reported observations concerning the immune response of human subjects to small intranasal doses of an attenuated form of the same strain of influenza virus, Type B, as was used in these studies. It is of interest to point out certain differences in effect and interpretation. Their subjects were selected because of low antibody titers, and the presence of immunity was, to a large extent, determined by failure to show a rise in antibodies to the second inoculation. The demonstration of virus in nasal secretions was also involved. The symptoms were extremely mild and mostly nasal; fever is not recorded. Certain of the rises in antibody to which they ascribe importance, seem of doubtful significance; an increase in antibody after reinoculation may not occur even with sharp clinical response. The predominance of nasal symptomatology in their cases as evidence of response is in contrast to its relative infrequency in the clinical disease. The absence of controls for the immunity test and for the nasal symptoms furnishes little basis for evaluating the results. Certainly, there is no evidence in our studies that subjects with highest antibodies respond with most marked symptoms; quite the contrary. Moreover, if frank infection fails to give uniform staunch resistance over a period of 4 months, it seems unlikely that single exposure to a much milder single stimulus by the same route will have a greater effect. Bull and Burnet have measured essentially the serological reactions to a mild application of attenuated virus and it seems doubtful that further inference of its effect upon resistance to clinical infection can be drawn at present.

From the studies here reported the suggestion is derived that if procedures devised for prophylaxis against influenza are to be effective they should be repeated at intervals shorter than 4 months. The evidence shows that the degree of resistance persisting 4 months after infection is less influenced by the severity of the original infection than by the responsiveness and con-

tinued activity of the individual's immune mechanisms, suggesting that selection may be made of those most in need of the additional stimuli.

SUMMARY

Inhalation of finely dispersed Type B influenza virus by human subjects resulted in a high incidence of clinical infection resembling a mild form of the natural disease.

Four months later 24 of the same subjects received a second inhalation of the same virus. Fever, symptoms and serological responses were noted a second time. The illness was milder in the majority of previously infected individuals than in controls inoculated at the same time. Few were refractory to reinoculation.

The diminished response to reinfection was most evident in those who had the highest fevers in the first test. Nevertheless, the evidence indicates that mild primary infections were as beneficial as the more severe ones.

Although there was a trend toward association between high antibody titers and low temperatures, no uniform correlation between the antibody titer of an individual and his response to inoculation was found.

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Epidemiology of Atypical Pneumonia and Acute Respiratory Disease at Fort Bragg, North Carolina*

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DURING the past decade atypical pneumonia has been recognized with increasing frequency both in the armed forces and in civilian groups.[1-4] The disease is a clinical syndrome which is similar in onset and symptomatology to moderately severe acute respiratory diseases, such as nasopharyngitis, bronchitis and grippe. The characteristic feature of the disease is the finding of a pulmonary lesion on roentgenographic examination in the absence of rigor, pleuritic pain, rusty sputum, and other signs which are usually associated with acute bacterial pneumonia. In fact, extensive radiographic shadows may be present without being evident by physical examination of the patient. Therefore, the frequency with which this syndrome is diagnosed depends upon the number and frequency with which routine roentgenograms of the chest are taken on patients with acute respiratory illnesses.

The incidence of the disease in the Army is high in relation to other forms of pneumonia. In certain Army camps where routine radiographic studies were made on all respiratory admissions and where careful bacteriological studies were done, it was found that from 85 to 90 per cent of all cases of pneumonia were of the atypical variety.[5, 6]

The etiology of the disease is unknown. Although a number of agents, viruses, rickettsiae, fungi, and bacteria have been shown to produce similar clinical syndromes,[7, 8] these agents have been thoroughly excluded as possible causes in the great majority of cases.[5, 6] Since there is a close clinical similarity between atypical pneumonia and common respiratory disease, the epidemiological studies in the present paper include a consideration of both diseases. Special emphasis has been placed upon studies of the incidence of respiratory diseases among seasoned men and new recruits, and upon the epidemiological relationship between atypical pneumonia and other acute respiratory infections. A brief description of an epidemic of German measles will also be presented for the purpose of contrast to the other findings.

The period of this study extends from October 31, 1942, to May 28, 1943. During this interval, the reported admission rates for common respiratory disease were similar to comparable rates for all troops in the Fourth Service Command and for the Army in the Continental United States. Moderate numbers of cases of meningococcal meningitis, streptococcal pharyngitis, and pneumococcal pneumonia occurred; but the total of all cases of known etiology was small in comparison with the total incidence of respiratory dis-

* Presented by Alexander D. Langmuir, M.D., at a Joint Session of the Epidemiology and Laboratory Sections of the American Public Health Association at the Seventy-second Annual Meeting in New York, N. Y., October 12, 1943.

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TABLE 1

Incidence Rates for Respiratory Admissions and Atypical Pneumonia per 1,000 per Week, FA RTC and Other Organizations Stationed at Fort Bragg, N. C. October 31, 1942, to May 28, 1943

Week Ending	FA RTC		Other Organizations	
	Respiratory Admissions	Atypical Pneumonia	Respiratory Admissions	Atypical Pneumonia
Nov. 6	5.4	1.0	1.3	0.31
13	6.2	1.0	2.5	0.38
20	10.2	1.5	2.6	0.38
27	9.4	1.3	2.6	0.34
Dec. 4	13.1	1.2	3.8	0.47
11	16.9	2.6	3.8	0.48
18	22.2	2.4	3.9	0.64
25	29.6	2.1	6.2	0.54
Jan. 1	36.3	3.5	6.2	0.69
8	25.8	4.0	7.1	0.98
15	19.3	2.1	8.4	0.76
22	13.9	1.9	6.3	0.46
29	10.2	0.67	5.1	0.44
Feb. 5	11.1	1.4	4.4	0.34
12	13.7	1.9	3.5	0.39
19	14.8	1.6	2.9	0.30
26	24.0	2.1	4.3	0.40
Mar. 5	24.5	1.9	2.7	0.22
12	28.3	1.8	2.9	0.22
19	26.2	1.9	3.5	0.36
26	21.6	1.2	2.5	0.32
Apr. 2	14.4	1.6	2.6	0.22
9	13.0	0.94	2.3	0.11
16	10.4	0.71	2.7	0.18
23	13.2	0.95	2.7	0.11
30	11.0	0.96	2.9	0.28
May 7	11.2	0.98	2.4	0.10
14	11.2	1.5	2.3	0.10
21	9.5	0.80	1.8	0.13
28	8.0	0.86	1.3	0.07

Officers excluded
Civilians excluded
Atypical pneumonia with onset in hospital excluded

ease. The great majority of the cases were undifferentiated respiratory infections of unknown etiology.

METHODS

The data on atypical pneumonia and German measles have been obtained by abstracting the records of the Registrar's Office, Station Hospital, Fort Bragg. The final diagnoses of the hospital staff on disposition of the cases have been accepted. Throughout the period of this study, the medical staff was searching for cases of atypical pneumonia. Frequent roentgenograms were taken on cases of respiratory disease in which this syndrome was suspected. The data on incidence of acute respiratory diseases have been obtained by tabulating the daily numbers of admissions to the respiratory wards of the hospital. The diagnoses in these cases are based upon the impression of the medical officers in the admitting office. A separation of these respiratory admissions into diagnostic groups has not been attempted.

Fort Bragg is a large army post situated in southeastern North Carolina. Among the various organizations stationed there, the one which has been studied in greatest detail is the Field Artillery Replacement Training Center (FA RTC). This organization is a school which gives basic training to new recruits. The trainees come directly from reception centers in all parts of the

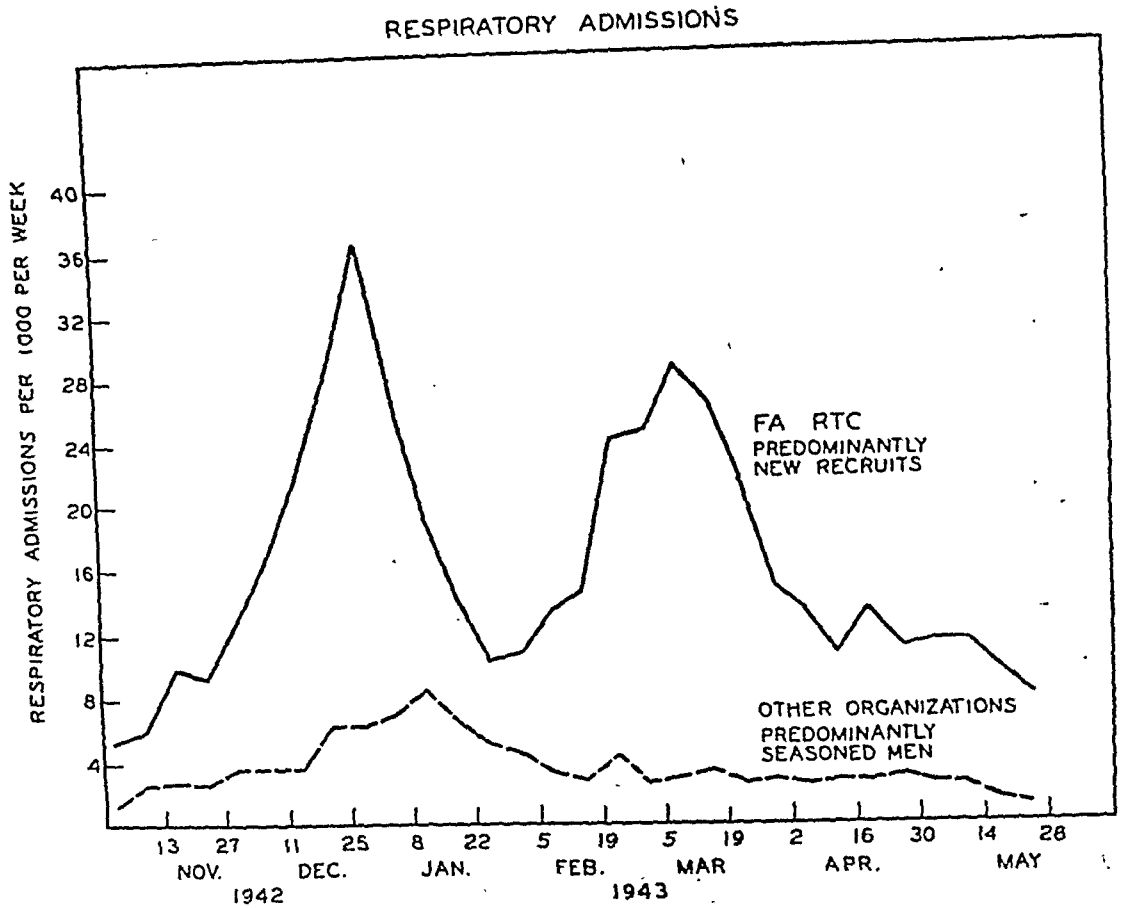


FIGURE 1—Incidence rates of respiratory admissions per 1,000 per week, FA RTC and other organizations stationed at Fort Bragg, N. C., October 31, 1942, to May 28, 1943

United States. The largest proportion, however, come from the northeastern states. With few exceptions, the men have had less than 1 month of military experience prior to their arrival, and the majority of them have been in the Army less than 10 days. At the time of their arrival, most of the recruits are grouped into battalions of approximately 1,000 men each, and are further subdivided into four batteries of 250 men each.

During the period of the present study, two separate courses of basic training were given in different battalions. One course, designed for limited service men, lasted 8 weeks. The other, designed for field artillery trainees, was of 13 weeks' duration. After completion of training, the men were transferred to other stations. Thus, there was an intermittent flow of large groups of new recruits through this center.

The other organizations on the post were tactical and service units which were composed largely of seasoned men with 3 to 6 months or more of military experience. Some of these organizations received complements of new recruits from time to time, but the size of such additions was small in comparison with the total strength of the units.

All soldiers at Fort Bragg were housed in standard two-story barracks originally designed for 63 men. Crowding in the barracks occurred in some organizations but this rarely exceeded 80 men per barrack. In the FA RTC, only occasionally were more than 70 men housed together in one building.

INCIDENCE OF RESPIRATORY ADMISSIONS AMONG NEW RECRUITS AND SEASONED MEN

The weekly incidence rates of respiratory admissions from the FA RTC and from the other organizations stationed at Fort Bragg are shown in Table 1 and Figure 1. In the FA RTC, the incidence began to increase in November and rose sharply to a peak of 36 cases per 1,000 per week in the last week of December. The rates fell abruptly during January, but rose again in February and reached a somewhat lower but broader peak in March. There was a *continuous downward trend in April and* May. The two peaks in this curve developed immediately following the arrival of large groups of several thousand new recruits.

The incidence rates for the other organizations on the post were markedly and consistently lower than the rates for FA RTC. They increased slowly through November and December, and reached a peak of only 8.4 per 1,000 per week in the middle of January, after which there was a progressive downward trend. Throughout the winter, the incidence in the FA RTC was from two to ten times as high as that in the other organizations. As will be shown later, this difference is clearly the result *of the high proportion of new recruits* in the FA RTC.

Study of the incidence of respiratory

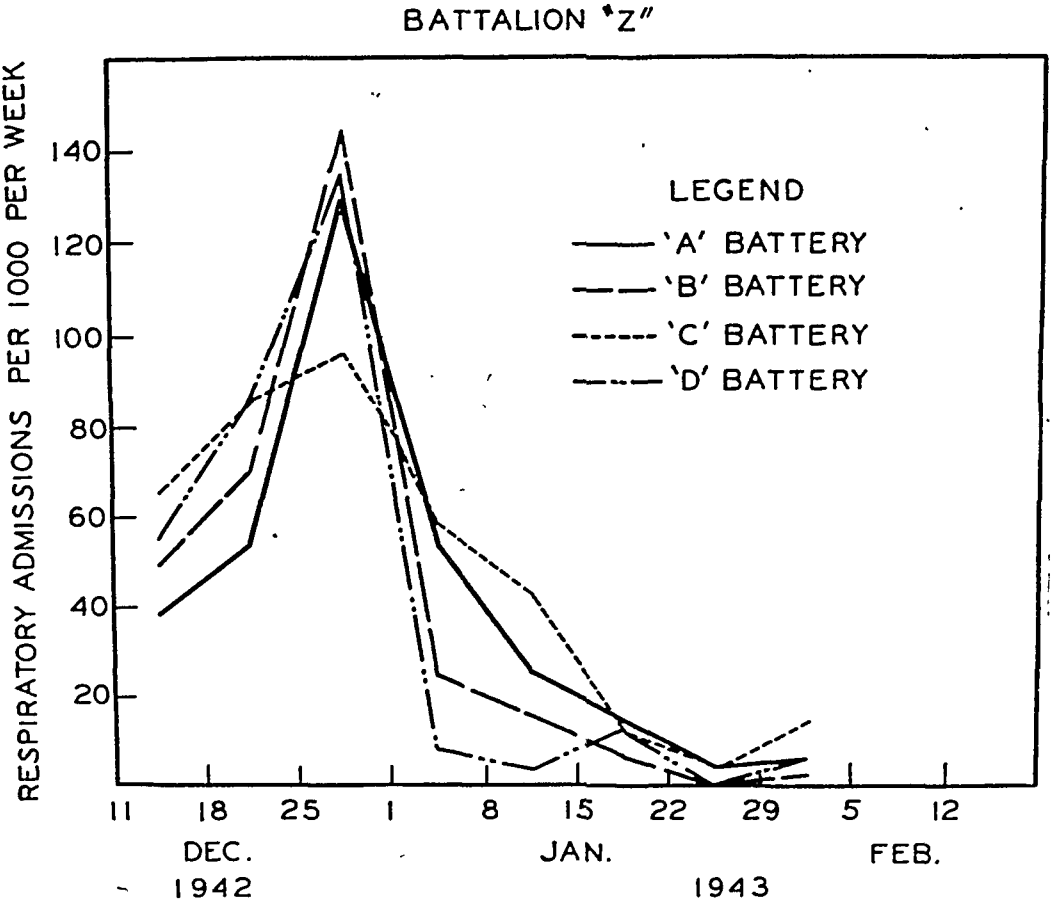


FIGURE 2—Respiratory admission rates per 1,000 per week, batteries of Battalion "Z," FA RTC, Fort Bragg, N. C., December 12, 1942, to February 5, 1943

TABLE 2

Respiratory Admission Rates per 1,000 per Week
Batteries of Battalion "Z" FA RTC, Fort Bragg, N. C.
December 12, 1942, to February 5, 1943

Week Ending		Batteries A			B			C			D		
		Strength	Cases	Rate	Strength	Cases	Rate	Strength	Cases	Rate	Strength	Cases	Rate
Dec.	18	236	9	38	239	12	50	239	16	67	231	13	56
	25	242	13	54	242	17	70	240	21	87	242	17	70
Jan.	1	242	32	132	242	35	145	239	23	96	242	33	136
	8	241	13	54	242	6	25	239	14	59	240	2	8
	15	241	6	25	242	4	17	239	10	42	238	1	4
	22	241	4	17	242	2	8	237	3	13	235	3	13
	29	240	1	4	241	0	0	235	1	4	233	0	0
Feb.	5	240	2	8	241	1	4	235	4	17	233	2	8
Total		240	80	333 *	241	77	320*	238	92	387*	237	71	300*

* Total rate for 8 week period

admissions in the battalions of the FA RTC revealed that the high rates occurred almost entirely during the first 4 weeks following the arrival of the trainees. A definite and rather characteristic epidemic of respiratory disease occurred in each battalion of new recruits which arrived between December 1 and April 10. The data on several of these battalions will be presented.

The incidence rates in the four batteries of "Z" battalion are shown in Table 2 and Figure 2. The men in this unit arrived between December 10 and 13. During the first week following arrival, the incidence rate was 50 per 1,000 per week. It increased moderately in the second week, and markedly in the third week, after which it fell abruptly. During the 8 week course of training, over 30 per cent of the entire group were admitted to the

TABLE 3

Respiratory Admission Rates per 1,000 per Week
Batteries of Battalion "Y" FA RTC, Fort Bragg, N. C.
December 26, 1942, to April 30, 1943

Week Ending		Batteries A			B			C			D		
		Strength	Cases	Rate	Strength	Cases	Rate	Strength	Cases	Rate	Strength	Cases	Rate
Jan.	1	...	..	..	158	2	13	150	10	67	152	7	46
	8	...	..	..	250	10	40	233	13	56	228	23	101
	15	...	..	..	239	22	92	243	24	99	235	19	81
	22	...	..	..	239	11	46	241	19	79	239	15	63
	29	...	..	..	239	6	25	238	5	21	240	10	42
Feb.	5	242	15	62	239	2	8	238	2	8	240	3	13
	12	242	41	169	239	1	4	238	1	4	240	1	4
	19	242	14	58	239	1	4	238	1	4	240	2	8
	26	242	9	37	239	2	8	238	1	4	240	4	17
Mar.	5	242	4	17	...	..	..	...	..	..	...	..	..
	12	238	4	17	242	15	62	208	12	58	100	8	80
	19	236	12	51	242	35	145	242	26	107	208	25	120
	26	236	2	8	242	25	103	242	23	95	229	22	96
Apr.	2	230	0	0	242	8	33	242	8	33	238	13	55
	9	...	..	..	235	3	13	232	13	56	214	4	19
	16	...	..	..	235	1	4	232	3	13	212	1	5
	23	...	..	..	235	1	4	232	2	9	212	2	9
	30	...	..	..	235	6	26	232	3	13	210	4	19

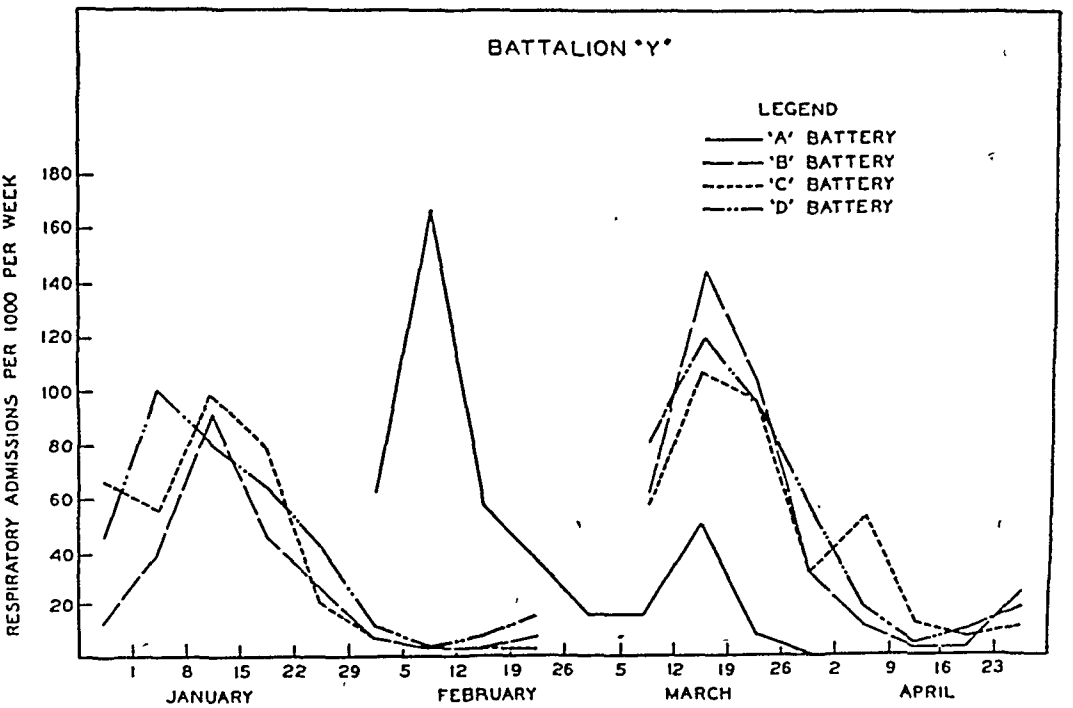


FIGURE 3—Respiratory admission rates per 1,000 per week, batteries of Battalion "Y," FA RTC, Fort Bragg, N. C., December 26, 1942, to April 30, 1943

hospital for respiratory disease, and 86 per cent of the cases occurred within the first 4 weeks.

In Table 3 and Figure 3, are presented the data on Battalion "Y" over a period of 4 months. In this battalion, three batteries of new recruits arrived during the week from December 26 to January 2. An epidemic of respiratory disease occurred during the following month. At the end of January, the fourth battery was filled with new recruits and a sharp increase in incidence occurred among them. The men in the first three batteries completed their training late in February and were transferred to other stations. New groups of recruits were assigned and an epidemic of respiratory disease occurred immediately following their arrival.

TABLE 4

Respiratory Admission Rates per 1,000 per Week, Battalion "X" FA RTC according to Length of Army Service Prior to Arrival at Fort Bragg—February 20 to April 16, 1943

Week Ending	Length of Army Service: Less than 30 Days — Strength	Cases	Rate	30 Days or More — Strength	Cases	Rate
Feb. 26	343	12	35	412	1	2.4
Mar. 5	509	11	22	420	1	2.4
12	530	25	47	421	1	2.4
19	530	36	68	421	1	2.4
26	530	15	28	421	1	2.4
Apr. 2	530	8	15	421	2	4.8
9	530	3	6	421	0	0
16	530	1	2	421	3	7.1
Total	504	111	220*	420	10	23.8*

* Total rate for 8 week period

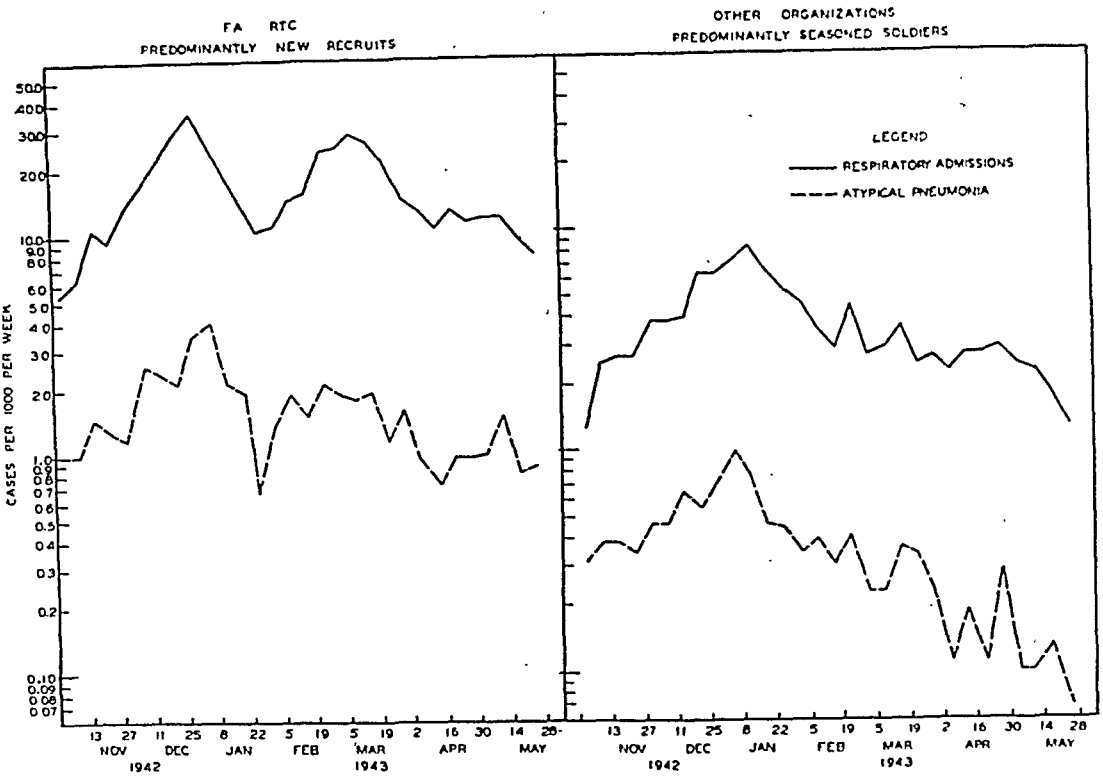


FIGURE 4—Incidence of respiratory admissions and atypical pneumonia per 1,000 per week, FA RTC and other organizations stationed at Fort Bragg, N. C., October 31, 1942, to May 28, 1943

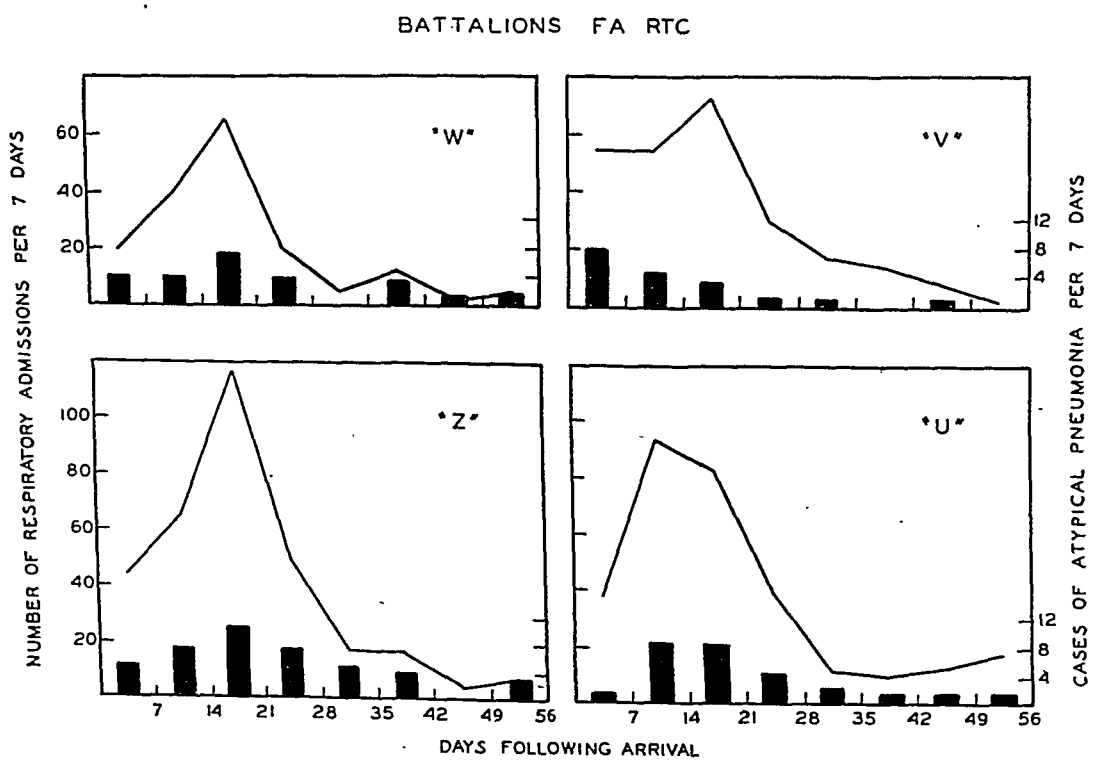


FIGURE 5—Incidence of respiratory admissions and atypical pneumonia, 4 representative battalions at FA RTC, Fort Bragg, N. C., December, 1942, to May, 1943

TABLE 5

Incidence of Respiratory Admissions and Atypical Pneumonia according to 7 Day Periods Following Arrival, among Four Representative Battalions, FA RTC, Fort Bragg, N. C. December, 1942, to May, 1943

Days Following Arrival	Battalions							
	"W"		"Y"		"Z"		"U"	
	Respiratory Admissions	Atypical Pneumonia	Respiratory Admissions	Atypical Pneumonia	Respiratory Admissions	Atypical Pneumonia	Respiratory Admissions	Atypical Pneumonia
7	20	4	55	8	45	5	38	1
14	39	4	56	5	64	7	95	9
21	66	7	73	3	118	10	85	9
28	21	4	32	1	49	7	39	5
35	5	..	17	1	18	5	12	2
42	12	3	12		17	4	10	1
49	1	1	8	1	4	..	13	1
56	5	2	1	..	9	3	17	1

An unusual situation obtained in Battalion "X" (Table 4). Approximately half of the men in this battalion came directly from reception centers, as in the other battalions, but the other half of the men came from a camp where they had been resident for a period of from 6 weeks to 3 months. This group, therefore, was not under observation during the apparently critical first month of army life. The data for this battalion have been grouped according to the length of service of the men prior to arrival at Forth Bragg. The men who had been in the Army less than 1 month experienced moderately high admission rates for respiratory disease, while among those who had had more than 1 month of army service, the incidence of respiratory admissions was negligible.

RELATIONSHIP OF ATYPICAL PNEUMONIA TO RESPIRATORY ADMISSIONS

There was an apparently constant relationship between the incidence of respiratory admissions and atypical pneumonia both in the FA RTC and in the other organizations on the post (Table 1, Figure 4). Throughout the period studied there is a rough parallelism between the incidence curves of the two diseases. In spite of marked differences between the total respiratory admission rates in the FA RTC and the other organizations, the ratio of respiratory admissions to atypical pneumonia was approximately 10 to 1 in both groups.

This relationship was maintained within the battalions of the FA RTC. In Table 5 and Figure 5, data are shown for four battalions according to

TABLE 6

Incidence Rates of Respiratory Admissions and Atypical Pneumonia, 14 Battalions FA RTC according to 7 Day Periods Following Arrival, Fort Bragg, N. C. December, 1942, to May, 1943*

Days Following Arrival	Respiratory Admissions		Atypical Pneumonia	
	Number of Cases	Rate †	Number of Cases	Rate †
7	456	36.2	47	3.7
14	737	58.6	62	4.9
21	917	72.9	54	4.3
28	460	36.6	43	3.4
35	197	15.7	16	1.3
42	130	10.3	12	0.95
49	96	7.6	13	1.03
56	86	6.8	10	0.80

* Total strength of these 14 battalions was approximately 12,600 recruits
† Rates expressed as cases per 1,000 per week

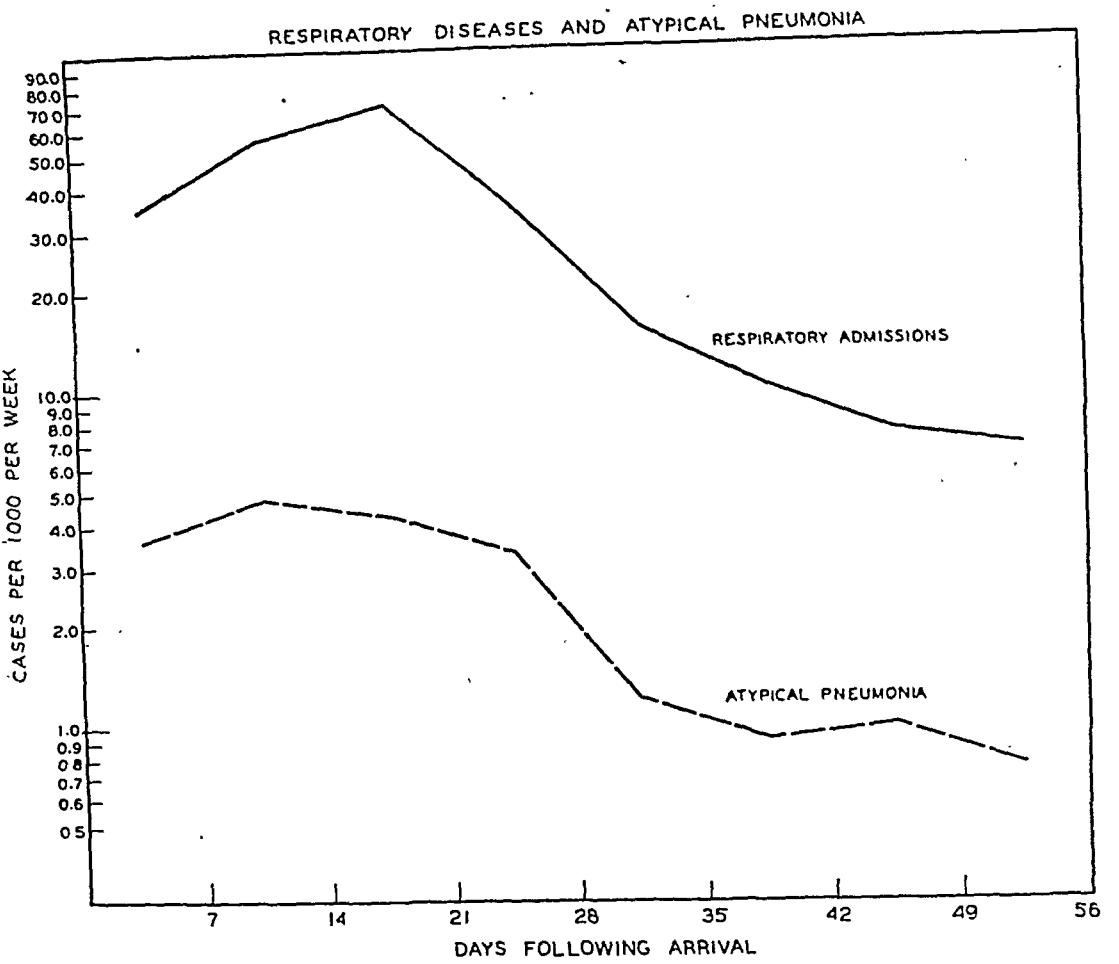


FIGURE 6—Incidence of respiratory admissions and atypical pneumonia among 14 battalions, FA RTC, according to 7 day periods following arrival at Fort Bragg, N. C., December, 1942, to May, 1943

7 day periods following arrival. These particular battalions have been selected from a group of 14 similar instances. They have been picked as representative examples to show the variations as well as the typical picture.

In 10 of the 14 groups, the peak incidence of atypical pneumonia coincided with that of respiratory admissions. Three examples, Battalions "U," "W," and "Z," are shown in Figure 5. In two of the remaining four battalions, the peak incidence of atypical pneumonia preceded that of the respiratory admissions as in Battalion "V"; and in two, the cases of atypical pneumonia were scattered without definite peaking.

Since the total number of cases of atypical pneumonia in each battalion was small, considerable chance variation might be expected. In order to reduce this variation resulting from small numbers, the data from 14 battalions have been consolidated according to time of arrival. The results are shown in Table 6 and Figure 6. The incidence, both respiratory disease and atypical pneumonia, was clearly concentrated during the first 4 weeks following the arrival of the men, after which the incidence was of the same order of magnitude as that among seasoned men.

CONTRAST BETWEEN GERMAN MEASLES AND RESPIRATORY ADMISSIONS

The occurrence of an epidemic of

German measles during the late winter and early spring of 1943 provided an opportunity for contrasting the distribution of a known specific infection with that of atypical pneumonia and respiratory disease. Scattered cases of German measles appeared in the FA RTC during January and February. The incidence rate increased rapidly and reached a peak of 6.7 per 1,000 per week in the week ending March 26. The rate dropped to 2.5 in the following week and progressively declined thereafter.

During the period of the German measles epidemic, 9 separate groups of new recruits were under observation. In 7 of these 9 groups, the peak incidence of German measles occurred during the week ending March 26. In one group, an equal number of cases occurred during the week ending March 19 and March 26, and in only one group did the highest incidence of this disease occur early in March.

In Figure 7, the time of occurrence of German measles is contrasted to that of the epidemic of respiratory disease in 5 representative battalions. The cases of German measles were clearly concentrated during the month of March. This concentration appeared

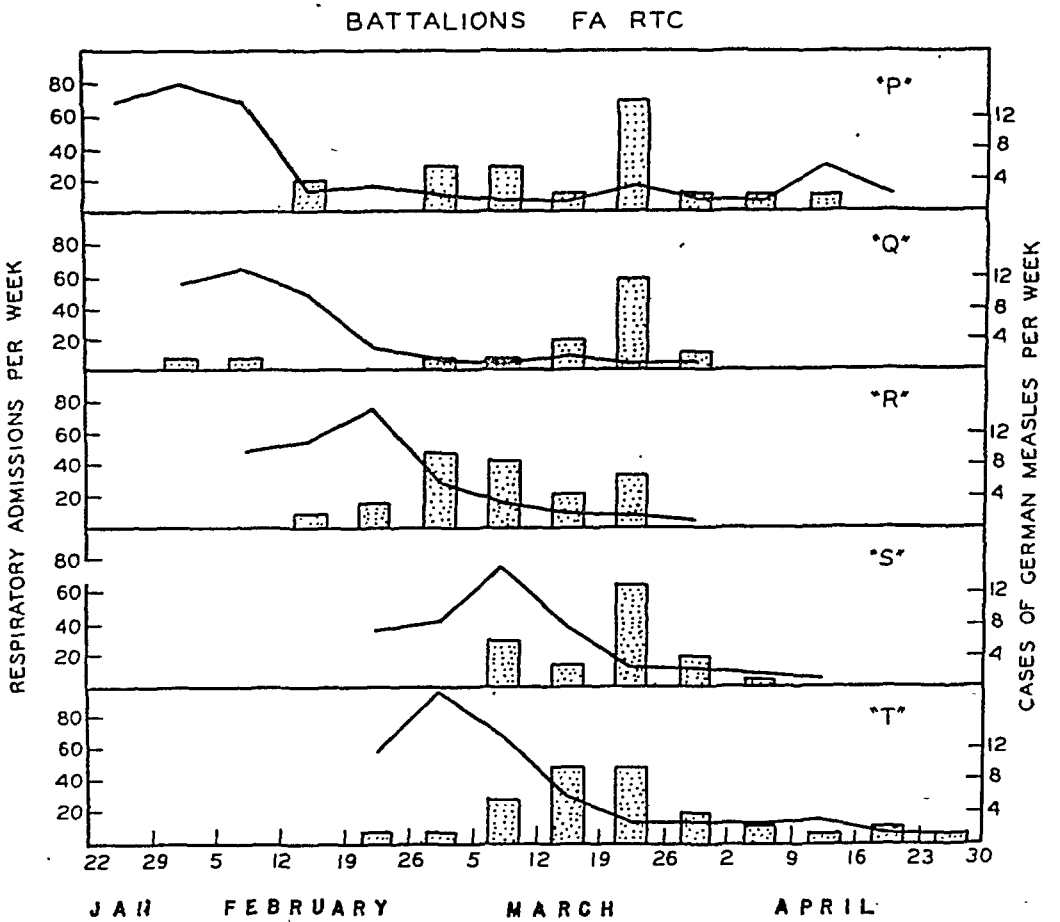


FIGURE 7—Incidence of respiratory admissions and German measles, 5 representative battalions, FA RTC, Fort Bragg, N. C., January 22 to April 30, 1943

to be unrelated to the time of arrival of the recruits. These findings stand in striking contrast to the epidemics of respiratory disease and atypical pneumonia, which occurred in each month from December to April and were directly related in every instance to the time of arrival of the men.

DISCUSSION AND SUMMARY

This study has served to emphasize the marked difference in incidence of respiratory disease between new recruits and seasoned soldiers. This phenomenon is well recognized in the Army.[9] Similar occurrences have also been described in certain civilian groups, particularly in schools.[10] The mechanism of this phenomenon cannot be explained adequately on the basis of present knowledge. Presumably, when large groups of individuals are brought together into a new environment, conditions become favorable for the development or spread of respiratory disease. In the absence of knowledge of the etiology of this group of diseases, it is impossible to determine whether the high incidence results from the interchange of numerous separate specific agents among individuals in close contact or whether the change in mode of living results, in some obscure fashion, in a breaking down of immunity or resistance to a common, single, specific agent.

It seems probable that both factors play a rôle in the phenomenon. It is recognized, for example, that certain diseases of known etiology, such as meningococcal meningitis and pneumococcal pneumonia, occur most frequently among new recruits.[9, 11] It is not clearly established, however, what part a preceding acute respiratory infection may play in the pathogenesis of these bacterial diseases. The one factor which is evident from the present studies is that during the past winter at Fort Bragg, the first 4 weeks of army life was a critical period, and that after the first 4 weeks, soldiers appeared to have an increased resistance to respiratory diseases.

The observations on atypical pneumonia indicate a close epidemiological association between this syndrome and common respiratory disease. Atypical pneumonia was continuously present at Fort Bragg throughout the period studied. The 10 to 1 ratio of respiratory admissions to cases of atypical pneumonia was maintained with reasonable constancy both among new recruits suffering a high incidence of respiratory disease and among seasoned men in whom the incidence was low. Taking this evidence in conjunction with the clinical similarity between the two diseases, the hypothesis is suggested that atypical pneumonia may be a severe manifestation of the same specific infection or infections which produce common respiratory illnesses. Reimann[12] and others[13, 14] have also advanced similar theories. Proof of such hypotheses, however, must rest upon demonstration of the etiological agent.

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NOTE: This investigation was supported through the Commission on Acute Respiratory Diseases, Board for the Investigation and Control of Influenza and Other Epidemic Diseases in the Army, Preventive Medicine Service, Office of the Surgeon General, United States Army, and by grants from the Commonwealth Fund, the W. K. Kellogg Foundation, the John and Mary R. Markle Foundation, and the International Health Division of the Rockefeller Foundation to the Board for the Investigation and Control of Influenza and Other Epidemic Diseases for the Commission on Acute Respiratory Diseases.

ACKNOWLEDGMENT — The Commission on Acute Respiratory Diseases wishes to thank the following officers and their staffs for assistance in making this study possible:

Major General D. C. Cubbison, Commanding General, FA RTC
Brigadier General H. C. Coburn, Jr., M.C., Surgeon, Fort Bragg
Colonel G. D. Chunn, M.C., Commanding Officer, Station Hospitals
Lieutenant Colonel H. O. Brown, M.C., Chief of X-ray Service
Lieutenant Colonel W. B. Daniels, M.C., Chief of Medical Services
Major G. R. Newton, A.G.D., Personnel Adjutant, FA RTC
Major A. M. Sands, M.C., Chief of Sanitation Branch
Major R. L. Siegel, M.C., Surgeon, FA RTC
Captain L. M. Bowen, M.C., Registrar, Station Hospitals
Captain D. L. Martin, M.A.C., Registrar, Station Hospitals

Primary Atypical Pneumonia*

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DURING recent years a rather characteristic syndrome in the group of respiratory diseases has been recognized with increasing frequency. This syndrome has been referred to by a variety of names, among them such terms as "atypical bronchopneumonia,"[1] "acute influenza pneumonitis,"[2] bronchopneumonia, variety X,[3] acute pneumonitis,[4-6] and disseminated focal pneumonia.[7] Loosely, and quite improperly in the light of our present knowledge, the infection has also been called "virus" pneumonia.[8]

Present evidence indicates that this syndrome has a diverse etiology. In the great majority of the cases, however, the cause cannot be demonstrated, but the illness is clinically similar to or indistinguishable from that due to known agents. The basis of discussion here will be those cases of unknown cause, officially designated by the Army as primary atypical pneumonia, etiology unknown.[9]

CLINICAL ASPECTS

The clinical characteristics of primary atypical pneumonia [8, 10-12] are those of an acute infection of gradual onset in which constitutional symptoms, such as headache, fever, malaise, and chilliness, predominate over respiratory symptoms in the early stages. A dry, irritating cough, sometimes paroxysmal in nature, develops soon after onset and may be accompanied by substernal discomfort, but rarely by true pleural pain. As the disease progresses, the cough becomes productive of mucus and of purulent or, occasionally, blood-streaked sputum. The typical bloody or "prune-juice" sputum of pneumococcal pneumonia does not occur. Coryza, sore throat, and gastrointestinal symptoms may be observed. The illness is ordinarily of mild or moderate severity and the patient does not appear as sick as his complaints would suggest. In a small proportion of the cases prostration, dyspnea, cyanosis, and circulatory collapse may occur, but this is not the common finding.

Physical examination in the early stages ordinarily reveals a moderately ill patient with a mild inflammatory reaction of the upper respiratory passages. The remainder of the examination usually reveals no abnormal findings. The leukocyte count is normal. Up to this point, then, there is little in the history or physical findings to suggest a diagnosis of primary atypical pneumonia rather than one of ordinary undifferentiated acute respiratory disease. The one objective criterion which most authorities require to establish the diagnosis of primary atypical pneumonia is the presence of a pulmonary shadow or lesion by roentenogram.[13-20] In a large proportion of the patients such a lesion is demonstrable radiographically

* Presented by John H. Dingle, M.D., before the Health Officers Section of the American Public Health Association at the Seventy-second Annual Meeting in New York, N. Y., October 12, 1943.

† Members of the Commission are Drs. John H. Dingle, Director, T. J. Abernethy, G. F. Badger, J. W. Beard, N. L. Cressy, Major, M.C., A. D. Langmuir, C. H. Rammelkamp, J. M. Ruegsegger (resigned), and E. Strauss, 1st Lt., M.C.

early in the illness, before the appearance of associated physical signs. The infiltration commonly begins in the perihilar region and spreads in a wedge- or fan-shaped fashion toward the periphery of the lung field. It appears soft and either patchy or homogeneous in character. It may have an appearance suggesting atelectasis.[21] The process most often involves the lower lobe, but may affect any lobe or combination of lobes.

As the disease progresses, it is accompanied by a remittent fever which varies between 99° and 104° F., persists for approximately 3 to 8 days, and terminates by lysis. The pulse and respiratory rates are relatively low during the febrile period. Rather late in the disease characteristic subcrepitant "sticky" moist rales appear over the area of infiltration. They are best elicited after cough and deep breathing, and usually persist for days or weeks even after the pulmonary fields have cleared roentgenographically. Signs of definite consolidation are usually lacking. Convalescence is ordinarily prolonged but uneventful, and recovery is the rule (Figures 1, 2, 3).

The above description characterizes the usual case of primary atypical pneumonia. Variations in this picture, however, are extreme. "Unrecognized" cases have been detected by routine radiographic examination of soldiers on active duty. These cases have definite pulmonary lesions associated with minimal subjective or other objective evidences of infection. An estimate of

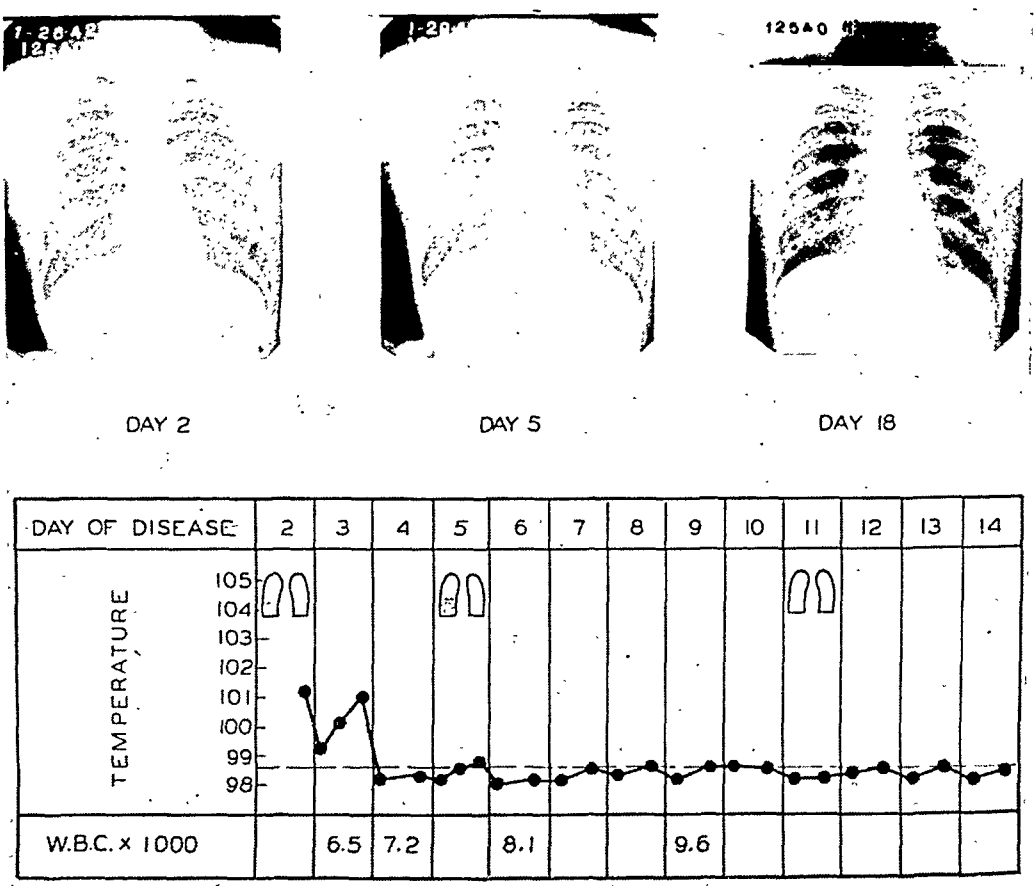


FIGURE 1—Clinical chart of patient with atypical pneumonia (mild infection)

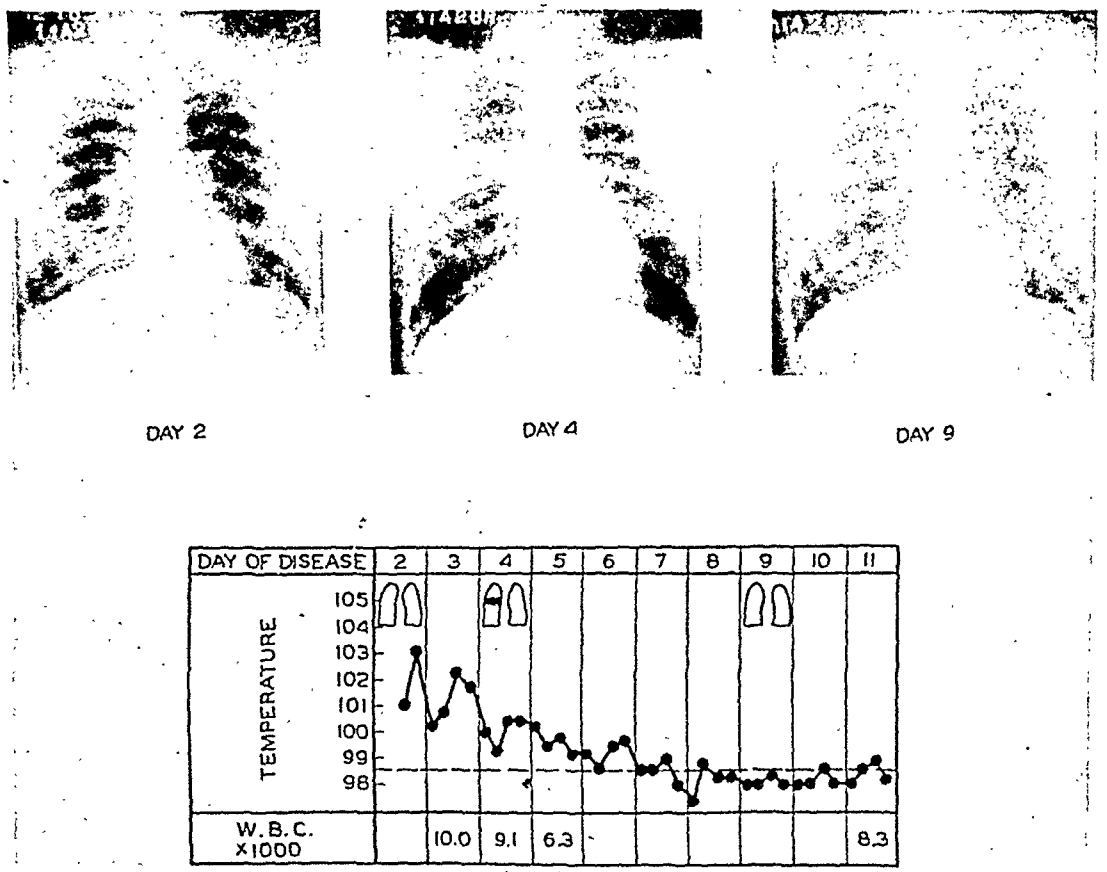


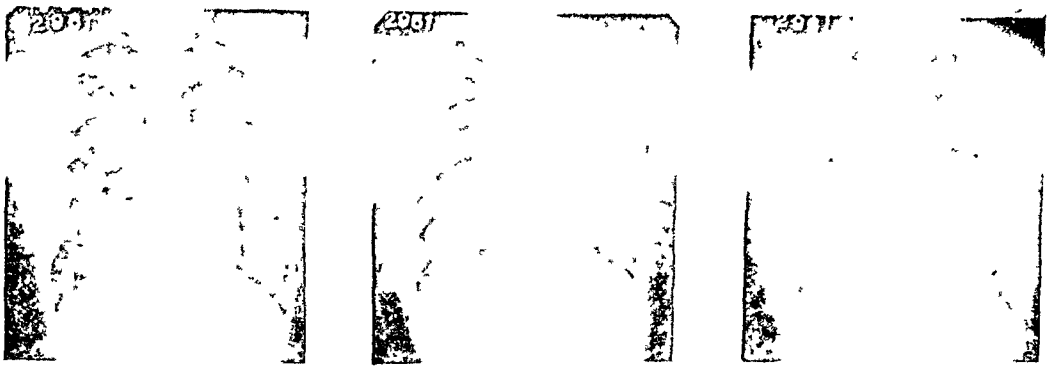
FIGURE 2—Clinical chart of a patient with moderately severe atypical pneumonia. Patient recovered after prolonged convalescence.

(Published in *War Med.*, 3:223, 1943.)

the frequency of occurrence of these cases is shown by the following figures:

In a group of 2,814 radiologic examinations for officers' candidate school at Fort Bragg, 12 cases of primary atypical pneumonia were discovered, indicating a prevalence rate among apparently "normal" soldiers of about 0.4 per cent (Figure 4). Relapses or recurrences of infection are not unusual during the course. Rarely the moderately severe or severe illness may be complicated by secondary bacterial infection, pleural effusion, bronchiectasis, or signs suggestive of involvement of the central nervous system. A fatal outcome is extremely rare, but may occur, even in apparently uncomplicated cases.

Another group of cases warrants emphasis at this point, since it may provide one of the keys to the solution of the problems of common respiratory disease. The group has been termed "bronchitis resembling atypical pneumonia" or "suspected atypical pneumonia," [11] and includes cases differing in no wise from the description given above, save in the absence of a pulmonary lesion demonstrable by roentgenogram and in the somewhat lesser severity of illness. The characteristic subcrepitant rales, occurring unilaterally in most instances, give evidence of pulmonary involvement. On the basis of the best clinical evaluation which could be made,[4, 5, 11, 22, 23] this group of cases seems to lie midway between primary atypical pneumonia and undifferentiated acute respiratory disease, without sharp border lines between the three groups (Figure 5). Epidemiological evidence appears to support this



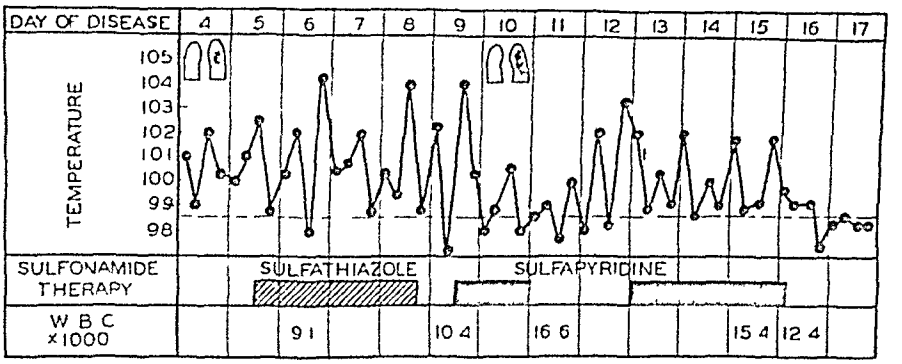


FIGURE 3—Clinical chart of a patient with severe atypical pneumonia. The febrile course was complicated by drug fever.

(Published in *War Med*, 3 223, 1943)

interpretation. Such relationships, of course, provide no proof of common causation, but they indicate one direction for further investigation in an attempt to define the scope of the problems of recognition and control.

The pathological changes in the lungs of fatal cases [8, 24, 25] are those of an interstitial bronchopneumonia, which may or may not be hemorrhagic in character, of acute bronchitis, and frequently of acute necrotizing bronchiolitis. Throughout the parenchyma the predominant infiltrating cell is mononuclear, whereas in the bronchial and bronchiolar reaction, polymorphonuclear leukocytes are ordinarily abundant. Bacteria are usually absent from the parenchyma. Inclusion bodies are not seen. The pathological picture is thus not in itself distinctive, but is comparable to that found in the bronchopneumonia occurring in a number of virus diseases such as measles, in psittacosis, and in other infections.

The treatment of primary atypical pneumonia at the present time is symptomatic and supportive. Complete bed rest, a daily fluid intake of 3,000 ml. or more, and an easily digestible diet are advisable. Opiates may be given for cough, headache, and malaise, since in some patients these symptoms are difficult to suppress. Analgesic or antipyretic drugs with marked diaphoretic activity are inadvisable, particularly for patients in whom sweating is a prominent symptom. Oxygen therapy is desirable if anoxemia is severe. Chemotherapy with the

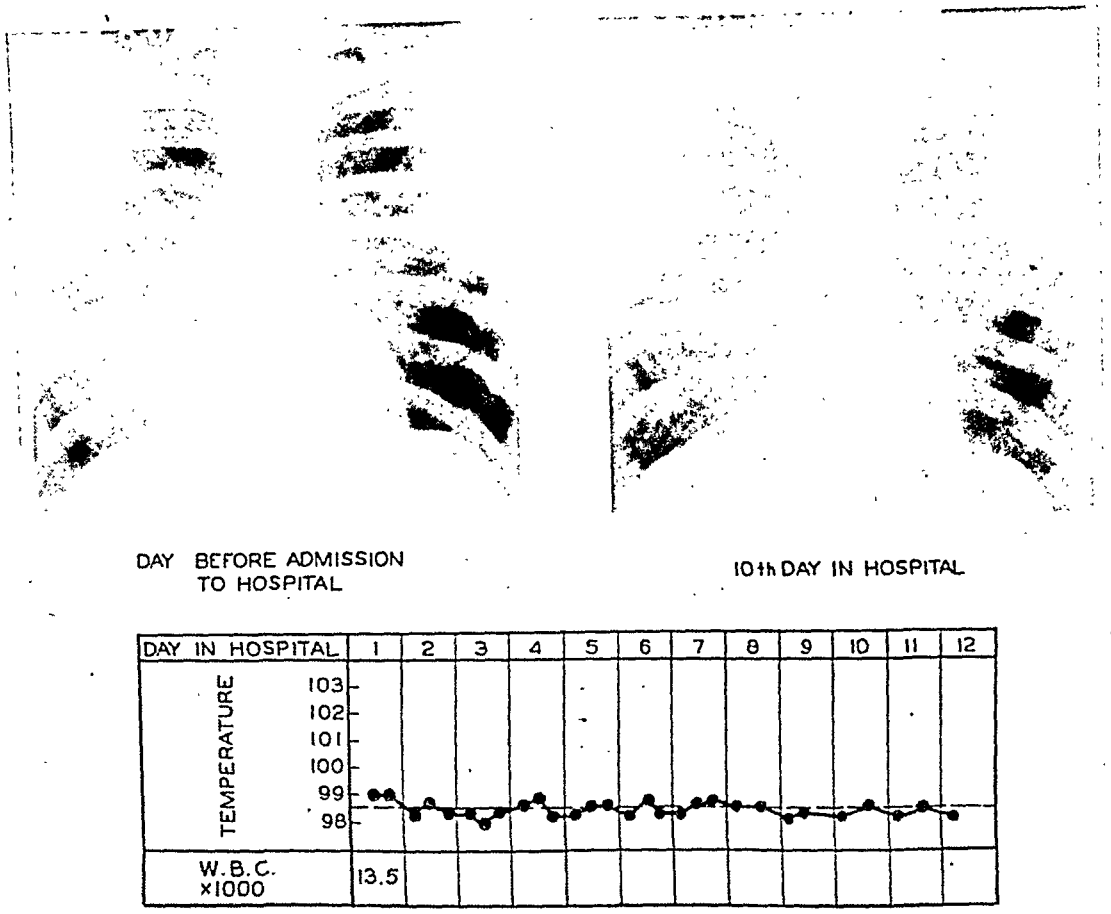


FIGURE 4—Unrecognized infection, probably atypical pneumonia, discovered by routine roentgenographic examination. There were no symptoms except a cough of 3 weeks' duration. No pulmonary signs were evident until the fifth day in the hospital. Recovery was uneventful.

(Published in *War Med.*, 3:223, 1943.)

sulfonamide drugs is of no benefit in uncomplicated cases and should be instituted only if secondary bacterial infection exists or, rarely, as an aid to diagnosis. A long period of convalescence is required in many cases because of the persistence of localized symptoms or signs, and of asthenia. There is no specific therapy available. The use of convalescent serum has been reported,[26, 27] but the evidence at present is insufficient to evaluate its effectiveness. Should primary atypical pneumonia prove to be a virus disease and thus be analogous to other virus infections, such therapy might not be expected to be of value from either practical or theoretical considerations.

EPIDEMIOLOGICAL ASPECTS

Primary atypical pneumonia is apparently a disease of widespread prevalence, both in endemic and epidemic form.[8, 10–12, 28] No race, color, or sex differences in incidence have been observed. The disease may affect any age group, but the majority of the outbreaks have been described in adolescents and young adults. In the armed forces [29–36] the syndrome has thus far been found wherever it has been sought, regardless of geographic boundaries. The incidence has varied, but in general has reflected the total incidence of respiratory disease.[37]

The source of infection is probably the oral and nasal discharges of per-

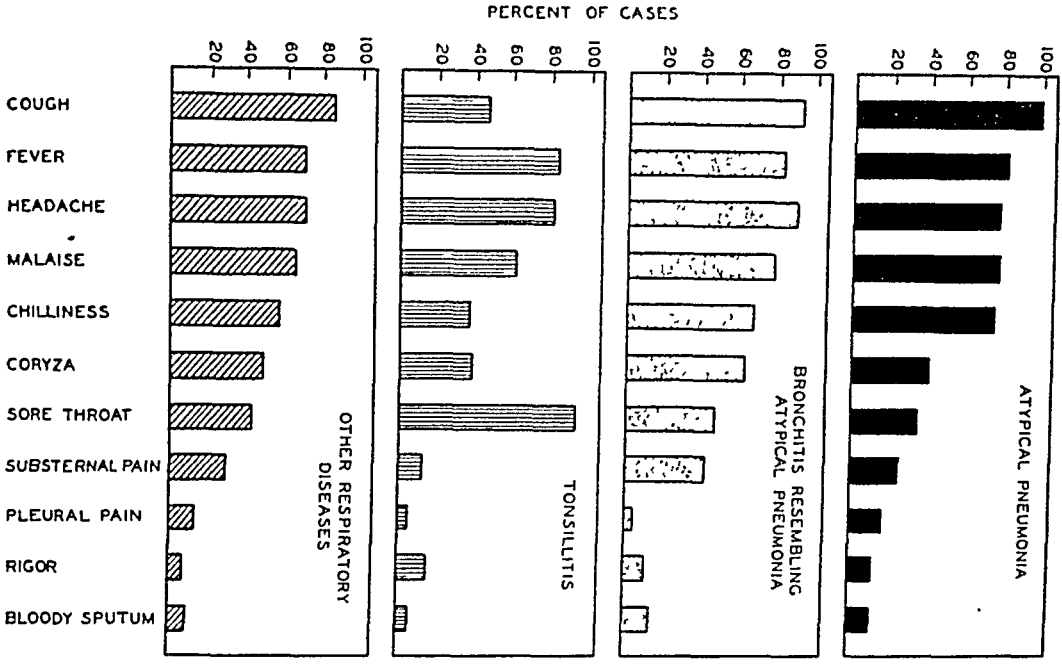


FIGURE 5—Frequency of certain symptoms in atypical pneumonia and other respiratory infections.

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sons with clinically recognized infections, of individuals with unrecognized infections, and possibly of healthy carriers. The mode of transmission is presumably by direct contact, or possibly by contact with articles freshly soiled with discharges from the respiratory tract, and by air-borne transmission. In the army camps thus far studied, there has been no evidence suggesting an intermediary vector such as food, water, or insects.

The incubation period is believed to be as long as 2 or 3 weeks, based primarily on the meager data available from a few instances of apparent case-to-case exposure. The period of communicability is entirely unknown.

Little is known about susceptibility and immunity to atypical pneumonia. It would appear that the population is not unusually susceptible in so far as clinically recognizable infections are concerned. Even during periods of relatively high incidence at an army post, for example, cases appear scattered throughout the personnel as if they were distributed at random, and case-to-case spread is usually impossible to determine. The picture is thus very similar to that obtaining with meningococcal meningitis. Individuals who may be exposed closely and repeatedly to patients, however, may show a higher incidence of infection. This has been noted in the professional staffs of hospitals, both under civilian [3, 26, 38] and military conditions.[11] Thus it might appear that susceptibility is low and that relatively high dosage, through close and repeated exposure, is necessary to produce the infection. It is, however, difficult to explain the spread of the disease on this basis. If "non-pneumonic" or "unrecognized forms" of the infection do exist as "suspected atypical pneumonia" and as undifferentiated respiratory disease, then susceptibility could be considered to be high and the distribution of the

"pneumonic form" could be explained.

The duration and nature of immunity are unknown. In all probability, any acquired active immunity is of short duration. During the past year at Fort Bragg, several instances of second attacks within a period of a year have been noted.

No specific measures for control are known at the present time, and only those general measures which can be instituted for any respiratory disease are available.

DIFFERENTIAL DIAGNOSIS AND ETIOLOGY

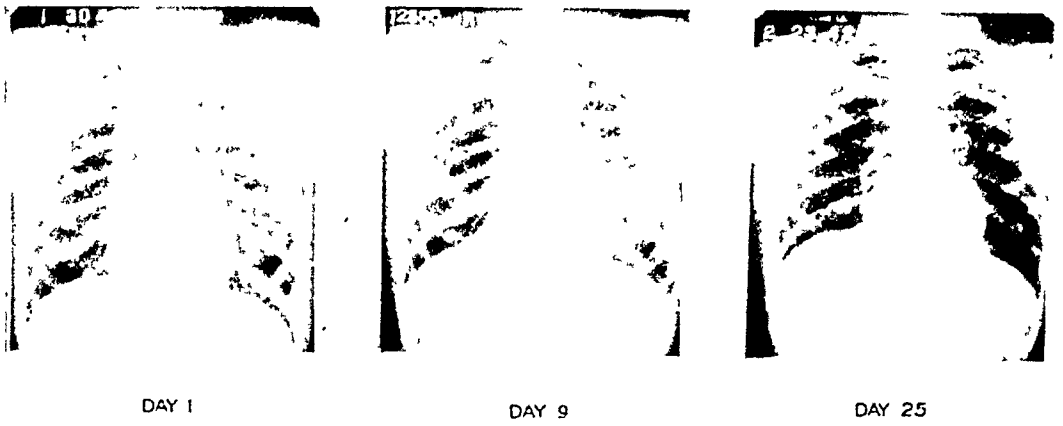
It is perhaps apparent from the above discussion that the final diagnosis of primary atypical pneumonia at the present time is an exclusion diagnosis, which can reliably be established only after other agents known to produce the same syndrome have been excluded, in so far as possible, in each individual case. Until a specific etiological diagnosis of primary atypical pneumonia can be made, certain representatives of each of the large groups of pathogenic microorganisms must be considered, including bacteria, fungi, rickettsiae, and viruses.

Bacterial pneumonias ordinarily are not difficult to differentiate from primary atypical pneumonia. The chief clinical features are abrupt onset, rigor, grossly bloody sputum, pleurisy, signs of pulmonary consolidation, and leukocytosis. Isolation of the infecting bacterium from the blood and sputum is usually readily accomplished, and such organisms as the pneumococcus, streptococcus, tubercle bacillus, staphylococcus, *Brucella abortus*, and *Pasteurella tularensis* may be obtained. In certain instances—approximately 10 per cent of hospitalized cases of primary atypical pneumonia—however, the differentiation may not be easy.[11] The onset may be sudden with rigor; the physical signs may be those of consolidation; a moderate leukocytosis may be present; or pneumococci, particularly of the "higher" types, or hemolytic streptococci may be isolated from the sputum. In these cases a therapeutic trial of the sulfonamides often is of aid in establishing the diagnosis (Figure 6).

Of the fungous infections, only coccidioidomycosis [39-41] is of appreciable significance in the differential diagnosis. Mild acute cases without demonstrable pulmonary involvement may simulate undifferentiated respiratory disease, and cases with pulmonary lesions may closely resemble primary atypical pneumonia. Chronic infections with granulomata and localized lesions are more readily distinguished. The localization of this infection geographically in southwestern United States, the use of coccidioidin as a skin test, demonstration of the development of antibodies in convalescent phase sera, and isolation of *Coccidioides immitis* all serve to identify this disease.

The possibility that rickettsial infection, other than the well known typhus and spotted fevers, might be confused with primary atypical pneumonia became apparent in 1939.[42, 43] Two years prior to this time, an apparently new disease entity, known as Australian Q fever, was reported from Queensland, Australia.[44] The following year a similar organism was found in ticks in Montana.[45] In 1939, the same rickettsia was isolated from a number of cases which occurred at the National Institute of Health and which presented the syndrome of primary atypical pneumonia. The evidence indicated that this organism, *Rickettsia burneti*, was the causative agent. Apart from this outbreak, however, there is thus far no evidence that the agent is responsible for more than a few sporadic human infections.

The fourth group of agents, the known viruses, presents a more complex situation. Presumably the viruses of influenza A and B may alone produce



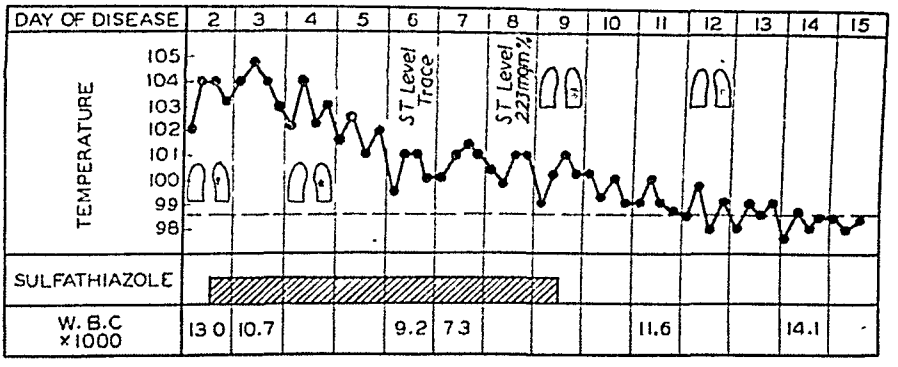


FIGURE 6—Atypical pneumonia having some of the clinical characteristics of pneumococcal pneumonia

pulmonary involvement, although the evidence in this regard is as yet scant.[46, 47] Certainly the clinical and epidemiological features of influenza during an epidemic are quite distinct from those of primary atypical pneumonia, yet in an individual case the differentiation may be difficult, if not impossible. It is therefore necessary to employ laboratory aids in diagnosis, the simplest of which is to determine the development of specific influenzal antibodies by comparing acute and convalescent phase sera.

Psittacosis, which has long been known to be a virus disease, has more recently come to be considered as a group of diseases caused by the " psittacosis " or " ornithosis " group of viruses. Viruses of this type have now been isolated from a number of different species of birds and animals,[47, 48] including man.[49, 50] Where a causal relationship has been established in patients, the clinical illness has in general been more severe although similar to that of primary atypical pneumonia. Attempts to relate this group of agents causally to primary atypical pneumonia occurring at Camp Claiborne, Fort Bragg, and other army posts, however, have been unsuccessful, in spite of the isolation of several strains of virus.[11] Confirmatory serological evidence could not be obtained from the patients' sera; in other words, an increase in antibodies was not demonstrable in the convalescent phase sera, and the level of antibodies appeared to correlate more with race and probable venereal exposure than with the respiratory disease under investigation. The close anti-

genic relationship of the virus of lymphogranuloma inguinale to the psittacosis group of viruses seems to provide the most logical explanation.[51-53] In addition, the possible saprophytic existence of the virus in man must be considered.

One other virus should be mentioned, namely, that of lymphocytic choriomeningitis. While the relation of this agent to respiratory illness has not been satisfactorily established, there seems little doubt that it can produce an influenza-like or grippe-like disease,[54] and in certain instances can cause pulmonary infiltration.[55]

It should be emphasized again that the above mentioned agents, which can be recognized, are actually responsible in the Army for an almost insignificant number of cases showing the syndrome of primary atypical pneumonia. In the great majority of the cases no evidence has been obtained that any of the known bacteria, fungi, rickettsiae, or viruses play an etiological rôle.

The search for new agents has not been neglected. A number of groups of investigators have reported the isolation of viruses from throat washings, sputum, or blood of patients with primary atypical pneumonia. These agents have been obtained by inoculation of ferrets and mice,[56] mongooses,[57] chick embryos,[57] cats,[58, 59] cotton rats,[60, 61] guinea pigs,[62] and mice after preliminary growth in tissue culture.[63] In no instance, however, has there been established a clear-cut relation between any one of the agents and the human disease.

The possibility that a laboratory test may be of value in the recognition of primary atypical pneumonia is suggested by recent reports [64-66] of the presence of cold agglutinins for Group O human erythrocytes in the sera of some patients. The specificity and sensitivity of this reaction has not yet been determined in a sufficient number of cases of primary atypical pneumonia and other respiratory infections to permit satisfactory evaluations. The data thus far obtained in the Commission laboratory at Fort Bragg indicate that the reaction may be positive in 25 to 50 per cent of cases of primary atypical pneumonia, and up to 10 per cent of cases of other types of respiratory disease, depending on the technic employed.

In summary, an attempt has been made to review the present status of knowledge concerning primary atypical pneumonia from the clinical, epidemiological, and etiological aspects. The importance of this problem to the military forces can only be estimated. In spite of the recognized difficulties in accurate diagnosis and reporting, the total number of cases recorded in troops in the continental limits of the United States from March, 1942, to May 8, 1943, was approximately 26,000.[67] The disease is not a significant factor in mortality, but is "an important cause of temporary disability, resulting in loss of man power hours and loss of days from training and other duties." [67] Primary atypical pneumonia is, numerically at least, the most important form of pneumonia affecting the armed forces today, and should it subsequently prove to be but a severe form of a more common undifferentiated respiratory disease, it will be one of the most important problems in therapeutic and preventive medicine facing the medical military services.

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NOTE—This work was supported through the Commission on Acute Respiratory Diseases, Board for the Investigation and Control of Influenza and Other Epidemic Diseases in the Army, Preventive Medicine Service, Office of the Surgeon General, United States Army, and by grants from the Commonwealth Fund, the W. K. Kellogg Foundation, the John and Mary R. Markle Foundation, and the International Health Division of the Rockefeller Foundation to the Board for the Investigation and Control of Influenza and Other Epidemic Diseases for the Commission on Acute Respiratory Diseases.

Antibiotic Substances, Production by Microörganisms—Nature and Mode of Action*

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THE mounting interest in the production, utilization, and chemical nature of penicillin has recently focused considerable attention upon the whole subject of antibiotic substances and their formation by microörganisms. Although the nature and activities of some of these substances have been known for many years, the wide horizons that have now been opened for their practical utilization in combating human and animal diseases have attracted the attention of the bacteriologist, the chemist, the public health worker, and the clinician, not to mention the manufacturer who has envisioned a repetition, on a vastly wider scale, of the possibilities opened by the discovery of the sulfa drugs.

Formation and nature of antibiotic substances — Antibiotic substances are antimicrobial agents, produced by a variety of microörganisms found among the filamentous fungi or molds, yeasts, actinomycetes, and bacteria. They are chemically and biologically distinct from the common antiseptic and germicidal agents, although certain synthetic preparations may have properties similar to those of antibiotic agents. They are primarily bacteriostatic in nature, that is, they inhibit the growth of bacteria, whereas their bactericidal activities are of only secondary consideration and require a longer period of time than that needed for ordinary disinfectants.

One of the characteristic properties of antibiotic agents is their selective antibacterial action. Some affect largely Gram-positive bacteria and act only to a very limited extent upon Gram-negative organisms; others, however, have the capacity of inhibiting the growth of certain bacteria belonging to each of these groups, and act only to a limited extent against other organisms within the same group. The selective action of antibiotic substances is not only qualitative but also quantitative in nature, much larger concentrations being required to inhibit the growth of some bacteria than of others. The term "antibiotic spectrum" is, therefore, justifiably used to designate a range of activity of an antibiotic substance against a number of bacteria selected from various representative Gram-positive and Gram-negative groups.

Antibiotic substances vary greatly in their chemical nature, in their mode of action upon bacteria, in their toxicity to animals, and in their *in vivo* vs. *in vitro* activity. Some are destroyed by boiling, by exposure to light, and by

* Journal Series Paper, New Jersey Agricultural Experiment Station, Rutgers University, Department of Soil Microbiology. Presented before the Laboratory Section of the American Public Health Association at the Seventy-second Annual Meeting in New York, N. Y., October 12, 1943.

passage through various filters, whereas others are resistant to heat and to ultraviolet rays. Some are readily adsorbed by various adsorbing agents, such as active charcoal and infusorial earth; they usually can be removed from these by means of special solvents, such as ether, alcohol, chloroform, acetone, acids, or alkalies.

In order to obtain an antibiotic substance, an antagonistic organism is selected for its specific antibacterial activity and grown on an organic or a synthetic medium. The period of incubation usually varies from 3 to 20 days, and the temperature from 20° to 30° C. Since these organisms are aerobic in nature, proper aeration of the culture is essential; hence, shallow layers of liquid culture media for stationary cultures or forced aeration for submerged cultures are used. The formation of the antibiotic substance is greatly influenced by the strain of the organism, the composition of the medium, and the conditions of growth. Some antagonistic microörganisms produce more than one antibiotic substance. It has also been definitely established that some substances or closely related compounds may be produced by more than one organism.

Saprophytic and pathogenic microorganisms—There is no plant or animal now living that is not subject to infection by a number of bacteria, fungi, and protozoa, resulting in numerous diseases and epidemics. These disease producing microörganisms sooner or later find their way into the soil and into water basins, either in the excreta or in the dead and infected residues of the host. Fortunately, these natural substrates are not recognized at the present time as carriers of most of the common infectious diseases of man and animals. As a result of extensive investigations, the conclusion has been reached that most of the disease producing agents do not survive long in the soil, but die out there at a rather rapid rate, depending on the nature of the organism, the nature of the soil, climatic and other conditions.

The antagonistic effects of saprophytic soil microörganisms upon pathogenic bacteria and fungi were at first visualized as resulting from competition for food between these two groups. It was soon recognized, however, that this was not a sufficient explanation for all the observed phenomena, included by Ward [15] under the general term "antibiosis." Organisms living in associations were found to develop frequently certain characteristics that they did not possess when grown in pure culture. Schiller,[10] for example, observed that when beer yeasts were placed together with tubercle bacteria in a sugar-containing but nitrogen-free medium, the former developed antagonistic properties toward the latter and used the latter as a source of nitrogen. The antagonists secreted a bacteriolytic substance that was also active outside the living cells.

Dubos [4] used the method of enriching a soil with cultures of living pathogenic organisms in order to stimulate the development of antagonists that brought about the destruction of the pathogens. In order to isolate an antagonist from an ordinary soil or from one thus enriched, it is sufficient to inoculate a suspension of living bacteria with the soil, or plate out the soil on an agar medium with these living bacteria as the major nutrient, as suggested by Waksman and Woodruff.[13, 14] A number of different antagonistic organisms have thus been isolated.[12]

The most important organisms known at the present time capable of producing antibiotic substances can be classified into four broad groups: 1. non-spore-forming bacteria, comprising *Pseudomonas aeruginosa* and various others; 2. spore-forming bacteria including *Bacillus brevis*, *Bacillus mesentericus*

and *Bacillus mycoides;* 3. filamentous fungi, especially members of the genera *Penicillium* and *Aspergillus;* and 4. actinomycetes, especially the aerial mycelium producing types of the genus *Streptomyces.*

The antagonistic action of *Pseudomonas aeruginosa* was first established in 1888 by Freudenreich,[8] who believed that the lack of growth of various bacteria in the sterile filtrate of the antagonist was due to the exhaustion of nutrients in the medium. The filtrate possessed bacteriolytic properties, believed to be due to an enzyme designated as "pyocyanase" and to the pigment pyocyanin. Since pyocyanase is thermostable, not sensitive to pH change and not precipitated by ammonium sulfate and alcohol, but is soluble in alcohol, a lipoid-like nature has later been suggested. This organism is now recognized as producing three antibiotic substances, including also hemipyocyanin. These substances differ in chemical nature and in their mode of action upon bacteria.

The production of antibiotic substances by spore-forming bacteria has long been established. This culminated in the isolation by Dubos [5] of the antibiotic agent tyrothricin, which consists of two distinct substances, gramicidin and tyrocidine; these differ in their chemical nature, mode of action upon bacteria, and toxicity to animals.

Among the fungi, various green molds belonging to the genera *Penicillium, Aspergillus,* and *Trichoderma* have long attracted attention as organisms possessing antibacterial properties. Vaudremer,[11] for example, demonstrated in 1913 that *Mycobacterium tuberculosis* loses its virulence in the presence of *A. fumigatus* or its products.

The ability of a member of the *Penicillium* group to produce an antibacterial substance was first established by Fleming [6] in 1929. This substance was designated as "penicillin." Various strains of *P. notatum* and *P. chrysogenum* are now known to produce this antibiotic agent. Clutterbuck, Lovell, and Raistrick [3] reported, in 1932, that these fungi produce three compounds, penicillin, a protein, and a pigment, only the first of which showed antibacterial properties. It was active largely against Gram-positive and certain Gram-negative bacteria, but not against most other Gram-negative bacteria. It was non-toxic to animals and was active *in vivo.*

This work attracted very little attention for nearly a decade until a group of Oxford chemists and pathologists [1,2,7] decided in 1940 to reëxamine the potentialities of penicillin for the treatment of various diseases. These investigations resulted in a series of contributions concerning the isolation, antibacterial properties, chemical nature, and mode of action of this important antibiotic substance.

It has been recently established that *P. notatum* produces, in addition to penicillin, another antibacterial factor, active not only against Gram-positive but also against Gram-negative bacteria. This substance was designated variously as the *Escherichia coli* factor, penatin, notatin, and penicillin B. It is a protein and functions as a glucose-oxidase. It has also been demonstrated that other fungi, notably members of the *A. flavus* group, produce a substance designated as flavicin that is similar to if not identical with penicillin.

Actinomycetes yielded several antibiotic substances; the most promising of these is streptothricin [14] which is active against many Gram-negative as well as Gram-positive bacteria, has a low toxicity to animals, and is active *in vivo.*

A fairly large number of other antibiotic substances have now been isolated, but many of these are toxic to animals, possess undesirable physical, chemical, or biological properties, or

TABLE 1

Summary of Chemical and Biological Properties of Some of the More Important Antibiotic Substances

Substance	*Organism*	*Active Against Bacteria*	*Properties*
Actinomycin A	*A. antibioticus*	Selective quantitative action.	Soluble in ether and alcohol, not in petrol ether; orange colored; highly toxic; thermostable; nitrogen bearing ring compound.
Aspergillic acid	*A. flavus*	Active against both Gram-positive and Gram-negative bacteria.	Soluble in alcohol, ether, acetone, not in petroleum ether. Acid nature. m.p. about 96° C.; m.w. 224; about 13 per cent nitrogen.
Citrinin	*P. citrinum*	Non-selective.	Soluble in water and in alcohol, precipitated by acid; quinone.
Clavacin	*A. clavatus*	Active against Gram-negative and some Gram-positive bacteria. Highly bactericidal.	Soluble in ether, chloroform, alcohol and water. Toxic.
Flavicin	*A. flavus*	See penicillin.	Similar in all respects to penicillin.
Fumigacin	*A. fumigatus*	Largely active against Gram-positive bacteria.	White, needle-shaped crystals; m.p. 185°–187°; soluble in alcohol, limited solubility in water.
Gliotoxin	*Trichoderma, Gliocladium*	Non-selective; fungicidal and bactericidal.	Soluble in chloroform, benzol alcohol, sparingly in water; contains nitrogen and sulfur.
Gramicidin	*B. brevis*	Lytic to Gram-positive bacteria.	Soluble in ether and acetone; thermolabile; active *in vivo;* polypeptide.
Notatin	*P. notatum* and *P. chrysogenum*	On Gram-positive and Gram-negative bacteria.	Insoluble in organic solvents, soluble in water; acts, in presence of glucose.
Penicillic acid	*P. puberulum*	Active against Gram-positive and also upon Gram-negative bacteria.	Colorless; soluble in water.
Penicillin	*P. notatum* and *P. chrysogenum*	Acts largely upon various Gram-positive aerobic and anaerobic bacteria.	Soluble in alcohol and water; thermolabile; active *in vivo;* low toxicity.
Proactinomycin	*Pr. gardneri*	Acts primarily upon Gram-positive bacteria.	Soluble in ether, benzene and water. Toxic.
Pyocyanase	*Ps. aeruginosa*	Lytic action on many Gram-positive and Gram-negative bacteria.	Thermostable; lipoid; activity largely due to unsaturated fatty acids.
Pyocyanin	*Ps. aeruginosa*	Bactericidal action largely against Gram-positive bacteria.	Chloroform-soluble, blue pigment; thermostable.
Streptothricin	*A. lavendulae*	Active on various Gram-negative and some Gram-positive bacteria.	Soluble in water and in acid alcohol, not in ether; organic base; thermostable. Low toxicity; active *in vivo.*
Tyrocidine	*B. brevis*	Lytic to Gram-positive and Gram-negative bacteria.	Soluble in alcohol, not in ether; thermostable; polypeptide.

have not as yet been studied sufficiently.

Chemical nature and activity of antibiotic substances—The antibiotic substances do not comprise a single group of chemical compounds but vary greatly in composition. Since very few of them have so far been crystallized and their chemical nature established, any system of classification of these compounds on the basis of their chemical relationship can only be tentative (Table 1). The following seven groups may now be recognized:

1. Polypeptides and proteins, including tyrothricin, lysozyme, actinomycetin, and notatin
2. Sulfur-bearing compounds, comprising gliotoxin and several others
3. Pigments, which include pyocyanin, hemipyocyanin, prodigiosin, chlororaphin, toxoflavin, and actinomycin
4. Lipoids and lipoid-like bodies. (These comprise a number of compounds produced by different types of microörganisms; only some of which, such as pyocyanase, have been investigated.)
5. Quinones and quinone-bearing compounds, including citrinin, penicillic acid, and fumigatin

6. Organic bases, comprising streptothricin and proactinomycin
7. Agents which are known to be produced by various microörganisms but which have not been isolated or studied in detail

The methods for measuring the activity of antibiotic substances are based upon their bacteriostatic nature, their selective action against various bacteria and other microörganisms, and the mechanism or mode of their action. Some of the antibiotic substances are also fungistatic, and even fungicidal in nature, like gliotoxin, actinomycin, clavacin, hemipyocyanin, the *Bacillus simplex* factor, and others.

On the basis of their toxicity to animals, the antibiotic substances can be divided into three groups: (1) Substances non-toxic to higher animals or possessing but little toxicity, when 0.5 gm. or more per kg. weight of animal is tolerated; here belong penicillin, citrinin, pyocyanase, streptothricin, actinomycetin, and fumigacin. (2) Substances that are fairly toxic to animals, including tyrothricin, notatin, and gliotoxin; although limited information precludes establishment of a toxic zone for these, a range of 0.1 to 0.5 gm. per kg. can be suggested tentatively. (3) Highly toxic compounds, such as actinomycin, clavacin and aspergillic acid; these are usually more toxic than 0.1 gm. per kg.; for many, such as actinomycin, as little as 0.15 mg. per kg. weight is toxic.

Of the various antibiotic agents, penicillin is the only one that has so far found an extensive chemotherapeutic application.[9] It is effective against hemolytic streptococcus and pneumococcus infections, as well as various staphylococcal infections; it is used in controlling local lesions of the eye caused by *Staphylococcus aureus;* however, it has no effect upon infections caused by *Mycobacterium tuberculosis, Trypanosoma equiperdum,* and influenza virus. It is effective against sulfonamide-resistant strains of pneumococci, although pneumococcus cultures can build up resistance against penicillin. In order to overcome the instability of penicillin and its rapid excretion, esters have been prepared which are said to be more stable and even offer promise of use by oral administration. Next to penicillin in chemotherapeutic value is tyrothricin which is being utilized for the control of mastitis in cattle and certain local infections. Pyocyanase was extensively used at one time for the treatment of various infections, but because of its instability, the variability of the organisms producing it, and insufficient knowledge concerning the conditions governing its formation, its use has been discontinued or been very greatly limited.

Mode of action of antibiotic substances—The mode of action of antibiotic substances upon bacteria consists largely in interfering with cell multiplication. This may be accompanied by a marked effect upon certain essential metabolic processes. On the basis of the limited information now available, the following mechanisms may be tentatively presented:

1. The antibiotic substance interferes with bacterial cell division, thus preventing further growth of the organism; the cell, unable to divide gradually dies. It has been shown by the use of the manometric method, that certain bactericidal agents in bacteriostatic concentrations may have no effect on the metabolic rates of bacteria; however, they inhibit cell multiplication.
2. The antibiotic substance interferes with the metabolic processes of the microbial cells, by substituting for one of the essential nutrients.
3. The antibiotic substance may interfere with the vitamin utilization of the organism; the staling effect of a medium, frequently spoken of in the case of protozoa as "biological conditioning" of the organism, may serve as an illustration; such effects have been overcome by the addition of a mixture of thiamin, riboflavin and nicotinamide.
4. The antibiotic agents bring about the

oxidation of a metabolic substance which must be reduced in the process of bacterial nutrition, or otherwise modifies the intermediary metabolism of the bacterial cell.

5. The agent combines with the substrate or with one of its constituents, which is thereby rendered inactive for bacterial utilization.

6. The agent competes for an enzyme required by the bacteria in order to carry out an essential metabolic process.

7. The agent interferes with various enzymatic systems, such as the respiratory mechanisms of the bacterial cells, especially the hydrogenase system; penicillin was shown capable of inhibiting the activity of urease.

8. The antibiotic substance may inhibit directly cellular oxidations, particularly those involving nitrogenous compounds, similar to the action of propamidine.

9. The antibiotic substance acts as an enzyme system and produces, in the medium, oxidation products, such as peroxides, injurious to the bacterial cell. The glucose oxidase produced by *P. notatum* catalyzes the following reaction:

$$\text{Glucose} + O_2 \rightarrow \text{Gluconic acid} + H_2O_2$$

10. The antibiotic substance favors certain lytic mechanisms in the cell, whereby the latter is destroyed; this mechanism may be either secondary or primary in nature.

11. The antibiotic substance affects the surface tension of the bacteria, acting as a detergent.

12. Bacteria subjected to the action of an antibiotic substance may develop mechanisms that render them resistant to the action of the substance.

13. Some bacteria may produce an enzyme, such as penicillinase, that brings about the destruction of the antibiotic substance.

SUMMARY

The utilization of antagonistic microorganisms, directly or through the production of antibiotic substances, offers three distinct potentialities to help man in overcoming his ills as well as those of his animals and of his crops:

1. Domestication of microörganisms for disease control.

2. Isolation of new chemotherapeutic agents for combating human and animal diseases.

3. Utilization of the activities of microorganisms for combating various plant diseases.

We are faced with a new field of research, which overlaps the fields of biology and chemistry and unites medicine with soil science. Many secrets of nature not sufficiently understood heretofore, will thereby be unraveled and new agents that may help man in combating diseases and epidemics discovered. This new field offers further great possibilities for the study of the nature and physiology of the bacterial cell, which may lead to a better understanding of the way of life of the smallest and, in many respects, the most interesting of the living systems.

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UNRRA's Public Health Plans

James A. Crabtree, M.D., acting chief of the Health Division of the United Nations Relief and Rehabilitation Administration, Washington, announced on February 21 the plans that are being made to deal with public health and nutritional problems in the occupied countries. Although it will be difficult to predict exactly what the conditions will be, Dr. Crabtree said that it was possible to make some intelligent guesses on what the conditions under a variety of premises might be, including what might be found under a completely scorched-earth policy.

Dr. Crabtree believed that the number one problem would be starvation, with all its relationships to public health, and he believed that increased death rates from maternal and infant causes, from malaria, and typhus, and from tuberculosis would have to be dealt with.

Dr. Crabtree felt that it was safe to predict that the breakdown of sanitary safeguards, together with crowding, lack of shelter, lack of clothing, fuel, soap, and the great movements of population would certainly result in epidemics. He said that some progress was being made on the assembling of personnel for these purposes. At present the UNRRA supply problem is more advanced than the plans for personnel, but UNRRA is fully aware that medical supplies would be worth little without medical service. However, a few teams of physicians, nurses, engineers, and other health specialists have been organized and the plan will be to send into each country as it is liberated a relatively small, well rounded team of experts in various specialties of public health to consult with and to assist national governments in building up and strengthening their own medical care services and facilities. In addition special teams will have to be organized to deal with certain special problems such as epidemics and diseases that have been introduced into the country for the first time. Dr. Crabtree said that, while some of the occupied countries would need only the help of such general and special teams of workers, others which had been "scorched" of professional personnel might need a substantial number of doctors and nurses to come in and actually to help take care of the sick.

Human Serum Albumin as a Stabilizing Agent for Schick Toxin*

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A LITTLE over a decade ago it was found that gelatin or peptone added to diluted diphtheria toxin would prevent rapid deterioration of the toxin. This made it possible to distribute diluted Schick toxin ready for use. One of the most widely adopted diluents in this country and elsewhere was 0.25 per cent Witte peptone, recommended by White, Bunney, and Malcolm in 1932.[1]

Beginning about 1934 there appeared scattered reports of acute generalized urticarial reactions immediately following the Schick test. These reactions were often severe and distressing, but never fatal. All cases showing reactions, on whom adequate histories were reported, had previously been Schick tested or had received immunizing injections. At the Antitoxin and Vaccine Laboratory we have received reports of 15 such reactions in the past 10 years, two of which have been observed by one of us. Similar reactions, following the injection of diphtheria or tetanus toxoid, have been reported by various workers. The conclusion of several investigators has been that the cause of these reactions is, in many instances at least, the presence of Witte or Berna peptone employed as a diluent or as a constituent of the medium.

In order to avoid these occasional reactions, we sought a satisfactory stabilizing agent of human origin which would itself be stable. About this time small quantities of human serum albumin were made available to us through the courtesy of Dr. E. J. Cohn of the Harvard Medical School. His material was prepared under contract with the Committee on Medical Research of the Office of Scientific Research and Development. Human serum had been recommended as a stabilizing agent several years earlier by Glenny and Stevens,[2] but we preferred to work with human albumin, since the albumin represented a highly purified preparation of what was known to be the most stable of the important serum proteins.

A number of batches of Schick toxin have accordingly been made, using human albumin as a stabilizing agent. All of these preparations were made with Glenny, Pope, and Waddington's borate buffer [3] as the fluid base. Potency has been tested (except where otherwise noted) by injection of 5 ml. subcutaneously into each of five guinea pigs of m.l.d. weight, observing the time of death of each animal. Stability of the toxin so prepared was, with but few exceptions, determined by heating samples for 24 hours at 37° C. (the official N.I.H. test) and at 41° C. (suggested by Glenny and Stevens). We have found the latter to be a very useful test of stability and one which gives an

* Presented before the Laboratory Section of the American Public Health Association at the Seventy-second Annual Meeting in New York, N. Y., October 13, 1943.

TABLE 1

Efficiency of Albumin as a Stabilizing Agent Potency Tested by Subcutaneous Injection of 5 ml. into Guinea Pigs

Experiment	Stabilizer: Agent (see note 1)	Stabilizer: Concentration Per cent	Average Days Till Death of Guinea Pigs (see note 2): Unincubated	Incubated for 24 Hours at: 37° C	Incubated for 24 Hours at: 41° C.
I. Varied Albumin Concentration Toxin Lot 66F, 0.2% Merthiolate 0.01%	Albumin #19	0.2	3.0	3.6	3.9
	" "	0.1	4.7 *	3.7	3.7 ‡
	" "	0.05	4.1 ‡	4.0	4.9 †
II. Same as Exp. I except for use of Albumin Lot 45	Albumin #45	0.2	3.7	3.4	3.6
	" "	0.1	3.6 *	3.6	4.3
	" "	0.05	3.4	4.9 †	5.1 ‡
III. Same as Exp. II except for use of Toxin Lot 44A, 0.38%	Albumin #45	0.1	3.5	3.5	4.2
	" "	0.05	4.0	4.0	4.5
IV. Same as Exp. III except for use of Albumin Lot P1	Albumin P1	0.2	3.6	...	3.9
V. Same as Exp. IV except for use of Phenol, 0.5% as preservative	Albumin P1	0.2	2.6	...	All survived
VI. Like Exps. III and IV except for omission of organic stabilizing agent	None	...	3.7	1 died 4 survived	1 died 4 survived
VII. Three Berkefeld-filtered lots:					
Toxin—Lot 44A, 0.37%	Albumin #19	0.05	4.6	4.5	4.5
" —Lot 44A, 0.38%	" "	0.1	3.2	3.3	4.1
" —Lot 44A, 0.35%	" P1	0.1	4.3	4.5	4.3
VIII. Three Peptone lots:					
Preservative: Phenol 0.5%	Witte Peptone	0.25	4.4	...	6.1
" " "	" "	0.25	3.1	...	5.9
Like III & IV except for stabilizer	" "	0.25	4.9	...	4.8

Note 1. All albumin-stabilized lots were diluted in Glenny, Pope and Waddington's borate buffer.[3]

Note. 2. Five guinea pigs were used for each test except when otherwise indicated as follows:

* 3 guinea pigs
† 4 guinea pigs
‡ 6 guinea pigs

answer in a short time. For a preservative, merthiolate 1:10,000 was used except in certain experimental batches.

The principal findings have been as follows:

1. For adequate protection of diluted diphtheria toxin, 0.05 per cent albumin is apparently insufficient, whereas 0.1 per cent is adequate but is apparently not quite as good as 0.2 per cent.

2. The above does not apply where phenol is used as a preservative, since concentrations of albumin as high as 0.2 per cent have failed to prevent deterioration in phenolized Schick toxin incubated at 37° C. for 24 hours.

3. Several batches of Schick toxin stabilized with albumin have shown no significant deterioration after exposure to 41° C. for 24 hours. This represents at least as high a stability as has been observed with any peptone-diluted toxin of our preparation.

4. No significant differences have been observed in Schick toxin prepared with three different lots of albumin or with two different lots of toxin.

5. Tests of albumin-diluted Schick toxins, according to the League of Nations standardization, have shown no significant differences from peptone-diluted toxin.

6. Duplicate Schick tests with albumin and peptone Schick toxin on 215 individuals, read at 4, 7, and, in some cases, 5 days, have shown certain minor differences. Opportunities for performing these tests were provided through

the kindness of Dr. Harold Norton and Dr. Roderick Dexter of the Massachusetts Department of Mental Health and Professor J. Howard Mueller of the Harvard Medical School. The albumin-diluted toxin as a rule:

a. Gave a brighter red positive reaction with more sharply defined borders.

b. Averaged somewhat smaller (209 sq. mm. as against 360 sq. mm. in comparable duplicate tests on 30 subjects).

c. In a few instances showed less tendency to fade by the 7th day.

d. Disagreed with the peptone reading in 13 of 70 presumably positive individuals. All of these disagreements represented a positive or combined albumin toxin reaction and a negative or pseudo peptone toxin reaction. Of the 8 of these 13 subjects on whom simultaneous serum antitoxin titers were performed, 6 were below 1/400 unit, indicating the validity of the albumin toxin readings.

Other studies on the material are being carried out and will be reported when completed. Meanwhile we recommend this preparation for further trial in the belief that it will prove suitable for general use.

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Surveys of the Nutrition of Populations*

3. The Vitamin A Nutrition of a Rural Population in Middle Tennessee

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In previous papers the general nature of the study has been described and results with respect to the energy principle (calories) and protein have been reported. This communication describes the nutrition of the population with respect to vitamin A.

METHODS

Dietary—The general procedure for recording the intake of food has been described.[1] For calculating the amount of vitamin A the tables of Booher, Hartzler, and Hewston [2] were used. In each instance the value most closely and clearly applicable in respect to season, variety, preparation, etc., was chosen. In the few instances where values for foods were lacking in the above table they were taken from other sources and when no values for a food could be found one was assigned arbitrarily on the basis of similarity to other food or on similar grounds.[1] In no case did these arbitrarily assigned values affect the results significantly.

History and Physical Examination—The general procedure for obtaining the medical history and for the physical examination has also been described.[1] For vitamin A, particular attention was paid to the history of such characteristic vitamin A deficiency diseases as xerosis, xerophthalmia, and the dermatosis; to night blindness; and to the symptoms of pre-xerosis, such as photophobia, burning and dryness of the eyes, asthenopia, and conjunctivitis. The taking of cod liver oil and other vitamin A preparations was also noted.

On the physical examination particular attention was directed to the skin and hair, to lesions of the eyes, and to vaginal discharge. A number of symptoms and signs such as the history and presence of respiratory infections, disorders of growth and development, abnormalities of the teeth and dentition and changes in the mucous membranes of the mouth and upper respiratory passages, whose significance to vitamin A deficiency is uncertain, were noted but are not analyzed here.

None of the symptoms and physical signs except those of the fully developed deficiency diseases are specific or pathognomonic for vitamin A deficiency, though some are of relatively high diagnostic value. It was necessary therefore to review these symptoms and signs in the light of the other evi-

* The studies referred to herein were conducted under the auspices of the International Health Division of the Rockefeller Foundation of New York City by the Nutrition Unit of the Departments of Medicine and Biochemistry of the Vanderbilt University School of Medicine, Nashville, Tenn.

dence obtained from the history and physical examination, and determine whether such signs and symptoms represented a vitamin A deficiency or were due to some other cause. This is clearly a matter of clinical judgment and must be based on experience with the manifestations of vitamin A deficiency states, the range of normal variations, and other causes of similar signs and symptoms. The decisions were made after a careful examination of each individual record without knowledge of the results of the dietary or laboratory studies, the original observations having been made by experienced examiners with an eye to such decisions. It is obvious, of course, that the probable correctness of the decision in each case must vary with the degree of specificity of the symptom or sign.

Laboratory Tests — The laboratory tests and special procedures included a test of visual adaptation to dim light (night blindness) and a determination of the amount of vitamin A and carotene in the blood serum.

The tests of dark adaptation were made with a Hecht and Shlaer adaptomoter,[3] measuring the rod threshold after a period of 20 minutes in complete darkness. Subjects, singly or in groups of 3 to 5, were seated in a completely dark room for 20 minutes after having been exposed to ordinary indoor light. After the 20 minute period of adaptation to the dark the light perception was tested according to the technic of the instrument. The purpose and nature of the test were explained carefully to each subject beforehand and every effort was made to secure satisfactory coöperation. At least three readings were made and the minimum value was taken. When there was any reason to believe the test was unsatisfactory it was discarded. Children under 4 were usually not tested and many above that age were unsatisfactory. An extensive experience with the instrument in studying such things as the learning factor and the influence of age, and the use of the complete test (bleaching and regeneration) in the examination of many patients with a wide variety of diseases and complaints, contributed to a successful application of the test. Most of the tests were made by the examining physicians and all were made at the hospital where a suitable dark room and electric current were available. The machine bears the manufacturers' number 18 and does not have gelatin cemented lenses. The lamp was carefully standardized with the help of a physicist and checked at suitable intervals.

The upper normal value commonly used is 3.5 ± 0.3 micromicro lamberts. Because, however, of some unavoidable variability in the subjects' response in such a test and because of what appears to us to be a slight but definite increase in threshold with age we have taken 4.0 micromicro lamberts as the upper limit of normal. It should be remembered that the error of the instrument itself is probably less than the unavoidable error of the subject's response.

The concentration of carotene and vitamin A in the blood serum was determined by May's method.[4] We found this micro-method may give slightly lower values than the macro-methods, but with a carefully controlled technic reliable values can be obtained. The lower limit of normal has been taken to be 70 International Units per 100 ml. of serum except in infants under 1 year of age for whom the value is 45 units.[5]

Blood was obtained from the sample drawn at the time of the physical examination, in most instances at least 3, usually 4–6 hours, after the last meal. About 30 ml. of venous blood was drawn with the least possible stasis in dry luer syringes. About 2 ml. was placed in a separate vial with an anticoagulant for hemoglobin determinations, etc. The remainder was placed

TABLE 1

Distribution of Average Daily Intake of Vitamin A Among Persons in the Survey According to Age, Sex, and Race, Together With the Number and Percentage of Subjects With Intake Below Recommended Allowances *

Vitamin A International Units	Age in Years: 1–3 M-F †	4–6 M-F	7–9 M-F	10–12 M-F	13–15 M	13–15 F	16–20 M	16–20 F	21+ M	21+ F	Total
White											
<500	2	1	2	2	0	0	0	0	2	2	11
500– 999	3	3	1	1	0	2	0	0	3	2	15
1,000–1,499	4	0	10	5	0	1	2	0	1	11	34
1,500–1,999	5	3	7	3	0	0	1	3	8	15	45
2,000–2,499	3	9	4	0	2	2	4	3	8	13	48
2,500–2,999	6	6	3	5	3	1	2	5	15	16	62
3,000–3,999	2	10	5	13	1	3	4	4	26	30	98
4,000–4,999	9	5	7	6	5	4	6	4	24	23	93
5,000–7,499	4	7	17	8	3	2	6	6	47	39	139
7,500–9,999	3	1	3	5	2	3	6	4	27	16	70
10,000+	0	2	7	2	5	1	4	2	57	53	133
Unknown	*0*	*1*	*0*	*1*	*0*	*0*	*5*	*2*	*10*	*9*	*28*
Total	41	48	66	51	21	19	40	33	228	229	776
Recommended dietary allowances	2,000	2,500	3,500	4,500	5,000	5,000	6,000	5,000	5,000	5,000	
Number with less than recommended allowance	14	16	29	32	11	13	21	19	87	112	354
Percentage with less than recommended allowance	34.1	34.0	43.9	64.0	52.4	68.4	60.0	61.3	39.9	50.9	47.3
Colored											
<500	4	1	5	5	1	0	0	1	3	8	28
500– 999	8	3	0	5	2	4	3	2	11	4	42
1,000–1,499	3	0	2	2	3	0	2	1	3	7	23
1,500–1,999	3	4	3	0	0	0	0	3	10	4	27
2,000–2,499	3	0	1	1	0	0	1	3	7	4	20
2,500–2,999	0	2	0	0	0	2	0	1	3	5	13
3,000–3,999	1	4	4	5	1	1	0	1	4	8	29
4,000–4,999	1	1	3	1	3	3	1	2	5	5	25
5,000–7,499	8	5	0	2	0	0	3	1	8	9	36
7,500–9,999	1	0	0	0	0	0	1	0	6	3	11
10,000+	1	3	8	10	4	4	9	8	35	36	118
Unknown	1	1	0	0	1	1	2	1	3	3	13
Total	34	24	26	31	15	15	22	24	98	96	385
Recommended dietary allowances	2,000	2,500	3,500	4,500	5,000	5,000	6,000	5,000	5,000	5,000	
Number with less than dietary allowance	18	8	13	18	10	10	8	14	46	45	190
Percentage with less than recommended dietary allowance	54.5	34.8	50.0	58.1	71.4	71.4	40.0	60.9	48.4	48.4	51.1

* Intake includes both vitamin A and carotene expressed as vitamin A. Recommended allowances for age and sex of Food and Nutrition Board, National Research Council. Twenty-five children under 1 year of age have been omitted.

† M = Male; F = Female.

in a 50 ml. pyrex centrifuge tube and allowed to clot. Blood drawn at the hospital was sent immediately to the laboratory, centrifuged, and the serum removed. When drawn in the field it was placed at once in iced containers where it kept during transport to the laboratory. With few exceptions the blood reached the laboratory within 4 hours.

RESULTS

Vitamin A Intake—Table 1 gives the average daily intake of vitamin A (carotene and vitamin A, expressed as vitamin A) with the number and per cent of those in each age, sex, and racial group with intakes falling below the recommended daily allowances of the Food and Nutrition Board.*

According to these standards the dietary intake was deficient (insufcient) in a large number, ranging from 34 per cent in the 1–3 age group to 68 per cent in the girls 13–15, among the white subjects, and from 35 per cent in children 4–6, to 71 per cent in boys and girls 13–15, in the colored. Although there is some difference in the frequency between white and colored subjects in some of the age and sex groups, this is probably not significant except in the children 1–3 and the boys 13–15 and 16–20. In the children 1–3, the greater frequency of the deficiency in the colored may reflect the lower intake of milk. The difference in the other two groups is unexplained.

History and Physical Examination—No subjects gave a history of any of the characteristic diseases of vitamin A deficiency such as xerosis, xerophthalmia, keratomalacia, or the dermatosis. Two hundred and four complained of one or more of such symptoms of pre-xerosis as dryness, burning, and sand in the eyes, photophobia, asthenopia, and conjunctivitis. Night blindness, generally considered a more specific symptom, was claimed by 60.

Symptoms of pre-xerosis were slightly more frequent in the colored than in the white subjects but much more striking differences were observed in some of the age and sex groups. In general the symptoms were much more frequent in adults (21 yrs.+), increasing from about 10 per cent in children, to 17 and 28 per cent in white, and 14 and 18 per cent in colored, men and women, but with a higher incidence in girls 13–15 and 16–20 which in colored girls amounted to 50 and 42 per cent. Night blindness occurred with equal frequency in white and colored, almost exclusively in adults and most often in white women.

Physical examination revealed no instances of well developed signs of vitamin A deficiency except for the dermatosis (eruption of the skin). Thirty-five subjects were found to have the characteristic dermatosis. Both the dry, horny, "goose flesh" type and the acneform type were observed. There were 12 instances of corneal scars which might possibly have been the result of lesions due to vitamin A deficiency in the past, and in 57 subjects changes were found in the sclera and conjunctiva which might be attributed to vitamin A deficiency. They consisted of the usual signs of conjunctivitis, redness and injection, sometimes dryness of the conjunctiva and such changes as a "muddy" and discolored (pigmented) sclera often with pingueculae or pterygia. Such changes are not very specific. The examination was made without reference to the findings, especially those detected with a slit lamp, described by Dr. Kruse, who had not yet published his observations.

The lesions in the eye, like the symptoms of pre-xerosis, and even night blindness, were by far the most frequent in adults. They were also found

* National Research Council

TABLE 2

Distribution of Adaptometer Values Among Persons in the Survey According to Age, Sex, and Race, Together With Number and Percentage With Values 4.0 or More *

Adaptometer Readings μμ Lamberts	Age in Years 1–3 M-F †	4–6 M-F	7–9 M-F	10–12 M-F	13–15 M	13–15 F	16–20 M	16–20 F	21+ M	21+ F	Total
					White						
<3.0	0	0	0	1	2	2	0	0	0	1	6
3.0–3.499	0	3	20	12	5	6	7	12	27	28	120
3.5–3.999	0	4	15	20	4	6	14	7	66	59	195
4.0–4.499	0	4	19	11	7	5	12	10	59	68	195
4.5–4.999	0	1	0	2	1	0	1	0	22	27	54
5.0–5.499	0	0	1	0	0	0	0	0	6	7	14
5.5–5.999	0	0	0	0	0	0	0	1	0	2	3
6.0–6.499	0	0	0	0	1	0	0	0	1	0	2
6.5–6.999	0	0	0	0	0	0	0	0	1	1	2
7.0 or more	0	0	0	0	0	0	0	0	2	3	5
Unknown	41	36	11	5	1	0	6	3	44	33	180
Total	41	48	66	51	21	19	40	33	228	229	776
Total tested	0	12	55	46	20	19	34	30	184	196	596
Number with 4.0 or more μμ Lamberts	0	5	20	13	9	5	13	11	91	108	275
Percentage with 4.0 or more μμ Lamberts	0	41.7	36.4	28.3	45.0	26.3	38.2	36.7	49.4	55.1	46.1
					Colored						
<3.0	0	0	0	0	0	0	0	0	0	0	0
3.0–3.499	0	0	10	10	3	7	5	5	16	16	72
3.5–3.999	0	1	3	10	3	3	8	7	27	16	78
4.0–4.499	0	3	3	9	5	4	4	9	26	34	97
4.5–4.999	0	0	3	2	1	1	2	3	16	9	37
5.0–5.499	0	0	0	0	0	0	0	0	1	4	5
5.5–5.999	0	0	0	0	0	0	0	0	0	1	1
6.0–6.499	0	0	0	0	0	0	0	0	1	3	4
6.5–6.999	0	0	0	0	0	0	0	0	3	0	3
7.0 or more	0	0	0	0	0	0	0	0	1	2	3
Unknown	34	20	7	0	3	0	3	0	7	11	85
Total	34	24	26	31	15	15	22	24	98	96	385
Total tested	0	4	19	31	12	15	19	24	91	85	300
Number with 4.0 or more μμ Lamberts	0	3	6	11	6	5	6	12	48	53	150
Percentage with 4.0 or more μμ Lamberts	0	75.0	31.6	35.5	50.0	33.3	31.6	50.0	52.7	62.4	50.0

* Twenty-five children under 1 year of age have been omitted.
† M = Male; F = Female.

about twice as often in men as in women and about twice as often in colored males (16 per cent) as in white males (8 per cent).

The dermatosis was found with equal frequency in the white and colored subjects but was practically limited to those past puberty. It was most common in the age group 16–20 and was found in one-fifth of the 40 white males of that age.

No significant association was found in the occurrence of the various symptoms and physical signs except that night blindness and the symptoms of pre-xerosis occurred together more frequently than either occurred in the total population. For example, night blindness was found in 16.7 per cent with symptoms of pre-xerosis but in only 5.5 per cent of the entire population. A vitamin A intake below the recom-

mended allowance was no more frequent in those with symptoms and physical signs of a deficiency than in those without.

Adaptometer—The results of the adaptometer tests are shown in Table 2 together with the percentage of those in the various age, sex, and racial groups showing an abnormal response. Among the entire group, nearly half (47 per cent) had an abnormal adaptation of vision to dark as measured by this test. The abnormality occurred most frequently in the adults, both white and

TABLE 3

*Distribution of Serum Vitamin A Concentration Among Persons in the Survey According to Age, Sex, and Race, With the Number and Percentage of Subjects With Concentration Below 70 International Units per 100 ml.**

Serum Vitamin A International Units per 100 ml.	Age in Years										
	1–3 M-F †	4–6 M-F	7–9 M-F	10–12 M-F	13–15 M	13–15 F	16–20 M	16–20 F	21+ M	21+ F	Total
					White						
0– 29	2	2	2	0	0	1	0	0	0	3	10
30– 39	0	1	3	2	0	0	0	1	1	2	10
40– 49	2	3	4	2	0	0	2	1	1	3	18
50– 59	2	4	6	6	0	2	1	2	3	3	29
60– 69	3	7	4	1	1	2	1	1	7	13	40
70– 79	4	1	7	5	3	2	2	3	14	15	56
80– 89	0	1	2	6	1	2	3	0	8	15	38
90– 99	0	0	1	1	0	1	0	2	14	10	29
100–119	1	0	2	2	2	1	3	2	27	22	62
120–149	0	0	0	1	0	0	1	1	21	5	29
150 or more	0	0	0	0	0	0	0	0	3	3	6
Unknown	27	29	35	25	14	8	27	20	129	135	449
Total	41	48	66	51	21	19	40	33	228	229	776
Total determinations	14	19	31	26	7	11	13	13	99	94	327
Number with less than 70 units	9	17	19	11	1	5	4	5	12	24	107
Percentage with less than 70 units	64.3	89.5	61.3	42.3	14.3	45.4	30.8	38.5	12.1	25.5	32.7
					Colored						
0– 29	0	0	0	0	0	1	0	0	0	0	1
30– 39	0	0	0	0	0	0	0	1	0	0	1
40– 49	0	0	1	1	0	0	0	0	1	0	3
50– 59	1	0	0	0	0	0	0	0	2	3	6
60– 69	3	1	0	0	0	0	0	0	1	2	7
70– 79	0	2	2	0	0	1	2	1	4	3	15
80– 89	1	1	1	2	0	0	0	2	3	1	11
90– 99	0	1	1	1	0	0	0	0	7	6	16
100–119	1	1	5	6	4	5	4	1	8	9	44
120–149	0	0	2	2	0	1	2	1	5	5	18
150 or more	0	0	0	0	0	0	0	0	1	0	1
Unknown	28	18	14	19	11	7	14	18	66	67	262
Total	34	24	26	31	15	15	22	24	98	96	385
Total determinations	6	6	12	12	4	8	8	6	32	29	123
Number with less than 70 units	4	1	1	1	0	1	0	1	4	5	18
Percentage with less than 70 units	66.7	16.7	8.3	8.3	0	12.5	0	16.7	12.5	17.2	14.6

* Twenty-five children under 1 year of age have been omitted.
† M = Male; F = Female.

colored, and was slightly greater in the negroes and in the women. Among the children the groups with the highest incidence of poor adaptation were the white and colored boys 13–15 and the colored children 4–6. However, only 4 of the latter of these were tested and the number of white children 4–6 years who were tested was also very small. No positive relationship statistically significant was found between heightened threshold (poor adaptation) and night blindness, the symptoms of xerosis, or the dermatosis. Curiously there appears to be a significant correlation between the occurrence of an elevated threshold and changes in the sclera. In subjects with the latter an elevated threshold was found in only 28 per cent compared with 49 per cent in those without these changes. The percentage difference was 21 ± * 6.8.

Blood Vitamin A—The values for vitamin A concentration in the blood serum are given in Table 3 † together with the percentage of the subjects in the various age, sex, and racial groups with values below the lower limit of normal. Because the determination of vitamin A in the blood was not introduced until near the end of the first examination period, determinations were made in only 450 of the subjects, but the number in most of the groups is large enough to be significant. Among the white subjects the highest incidence of an abnormally low concentration is found in the younger children (1–12), though many of the girls 13–15 and 16–20 had low values in sharp contrast to boys of the same age. Boys 13–15, and men 21+ least often had a low vitamin A concentration. A striking finding is that greater frequency of low vitamin A values seem to be more frequent in the whites than in the negroes, the difference being considerable in all groups except the youngest children (1–3).

There appears to be no relation between low blood vitamin A concentration and the occurrence of night blindness, the symptoms of xerosis and the dermatosis. However, an intake of vitamin A below the recommended allowance was somewhat more frequent (68 per cent) in those with low blood vitamin A than in those with normal blood values (46 per cent), a difference of 22 per cent ±3.5. An apparently significant inverse correlation is found between low blood vitamin A values, physical changes in the sclera and high adaptometer values. Only 7 per cent of the 42 subjects with changes in the sclera who have blood vitamin A determinations had low blood A values, compared with 30 per cent for those without such eye changes, a percentage difference of 23 ± 7. Of the 95 with blood vitamin A below 70 I.U. only 17, or 18 per cent, had adaptometer readings above 4 micromicro lamberts, while 52 per cent of the group with normal blood vitamin A values had such adaptometer readings, a percentage difference of 34 ± 5.

DISCUSSION

There are three aspects of these results which are of particular interest and importance. They are: (1) the relatively large amount of vitamin A deficiency as indicated by the dietary intake records, the adaptometer test and the vitamin A level in the blood, (2) the relative scarcity of symptoms and physical signs of a deficiency, and (3) the lack of correlation between all these various measures of vitamin A nutrition.

According to the dietary records there was a deficient vitamin A intake in 48 per cent of the population as a whole and in a much larger proportion of certain groups, and, by that measure, a presumable vitamin A deficiency *state*

* Figures following ± sign refer to standard deviation of the difference.

† The values for carotene in the blood serum have been omitted to conserve space.

in a similar number. But, dietary intake as recorded here, and as a practicable procedure under similar circumstances, is not an accurate or reliable measure or test of the actual state of nutrition in respect to vitamin A. This is even more true of vitamin A than of some of the other nutritive factors because of the greater storage and reserve capacity in case of vitamin A. With this greater reserve the defects and errors inherent in a record of dietary intake over a necessarily limited period of time are exaggerated. The limitations of the dietary intake method are particularly great at the level of a slight deficiency, the indeterminate zone between no deficiency and some deficiency. Only in the more severe dietary failures, and in monotonous diets of limited variety and fixed quantity do intake records reach any considerable degree of reliability in the *assessment* of individual nutrition.

A second factor which must be taken into account in the interpretation of the results is the standards which are used. Those of the Recommended Allowances, while probably desirable to foster a liberal intake of an important nutrient, may be higher than are needed to protect against a true physiologic deficiency as recognizable today. Use of such standards increases the apparent deficiency indicated by the dietary intake.

The measurement of the rod threshold for light perception as a test of vitamin A deficiency is similarly open to criticism, not only of its accuracy but of its specificity. Measurable impairment of dark adaptation undoubtedly occurs in vitamin A deficiency but a variety of errors, mainly subjective, cause some unreliability, particularly at the level of slight impairment, and there are other causes of impaired dark adaptation than vitamin A deficiency. Some of these sources of error are particularly operative in the mass examination of populations and are of less importance in tests of individual patients. The opportunity to make repeated and more complete tests, to search for evidence of other disease, and to use the therapeutic test enhance greatly the reliability of the adaptometer test in clinical practice.

Just how reliable test is under the conditions of this survey is uncertain. In such a general population, error from such causes as retinitis pigmentosa, which is very rare, and anoxia in the usual sense must be very small, particularly because the complete history and physical examination helped greatly to exclude such causes. However, we have observed in other studies a distinct tendency to elevation of the rod threshold with advancing age. Examination of the data under consideration shows a direct relation between increasing age and the proportion of those with an elevated threshold, the latter rising very sharply to over 70 per cent in those beyond 40 years of age. Furthermore, thresholds of 5 micromicro lamberts or over were more than 12 times more frequent in persons over 40 than in the younger subjects. Experience under comparable conditions and with a similar group of people in whom the effect of administering vitamin A under adequately controlled conditions was studied suggests that in about 50 per cent of the cases the finding of an elevated threshold by this technic represents a vitamin A deficiency or an elevation which can be reduced by the administration of vitamin A (cod liver oil). Finally it should be pointed out that the instrument allows a very delicate measurement of light perception, that at the levels of the slightest or earliest deficiencies the subjective error of the subject's response may exceed the instrumental error, and hence slight variations from the accepted normal are of little significance, at least under the conditions of such a survey as this.

Fewer objections can be made to the concentration of vitamin A in the blood plasma or serum as an index of vitamin A nutrition. Conditions other than a deficiency of vitamin A may at times affect the level of vitamin A in the blood but in most population groups they are an insignificant factor. (In individual patients such cases are ordinarily revealed by the examination.) Temporary variations may be caused by fluctuations in recent intake and the use of blood analysis as a test of vitamin A deficiency has been objected to on these grounds. However, falsely high values, not representative of the general body store and state of nutrition, are unlikely in a deficiency unless there has been recent ingestion of exceptionally large amounts, a fact which can be ascertained from the history. On the other hand it has been quite clearly shown that individuals with normal stores when placed on a reduced intake do not suffer from a reduction in the concentration in the blood for long periods, until, indeed, an actual deficiency of at least the reserve store develops.[6] Consequently, deprivation for short periods is unlikely to cause a false low value in individuals actually in normal nutrition, i.e., unless there actually exists a deficient reserve.

Assuming that the concentration of vitamin A in the blood reflects the general level of vitamin A and the reserve stores in the body and that under the conditions of such a survey as this it is not unduly influenced by extraneous factors and temporary fluctuations in vitamin A intake, the significance of an abnormally low concentration as an index of vitamin A deficiency may still be a matter of dispute. Actually it depends on the definition of vitamin A deficiency. If by vitamin A deficiency is meant the presence of demonstrable signs of disturbed function or structure, a low blood vitamin A is not a reliable sign of deficiency. Low concentration of vitamin A in the blood is found without evidence of disturbed function or structure, and the latter are observed without low vitamin A of the blood because the latter responds more quickly to increased intake of the vitamin. In view, however, of the inability to detect the earliest disturbances in function and structure, or to determine at what level of reduced blood or body content and store they first appear, the concentration of vitamin A in the blood may be used as an index of vitamin A nutrition and a concentration below the generally established "normal value" may be taken as evidence of a deficiency. Certainly the lack of an adequate and usual store or reserve, which under usual or "normal" circumstances protects against actual deficiency during periods of temporary shortage of supply or increased demand, can be taken, especially for public health purposes, as an abnormal state and a deficiency in a practical sense.

In contrast to the relatively frequent state of vitamin A deficiency disclosed by the diet record, the adaptometer readings and the blood vitamin A tests, the amount of deficiency revealed by history and physical examination was surprisingly meager. The greater number with *symptoms* is probably a reflection of the lesser reliability or specificity of these manifestations. Although many of the complaints of dryness of the eyes, burning, asthenopia, etc., may have been the result of mild vitamin A deficiency there is absolutely no means of distinguishing such cases with certainty from similar symptoms with other causes. Furthermore, a lack of correlation between the symptoms and physical signs and such evidences of deficiency as the dietary intake and laboratory tests cannot be taken as an indication of the reliability of those symptoms and signs for reasons to be discussed below. It may be observed however that these remarks apply only

when the signs and symptoms are an expression of mild deficiencies. Night blindness for example is probably a highly reliable symptom when it is severe.

Objective physical evidence of a deficiency was even less frequent than symptoms, as is to be expected, but, at least in respect to the dermatosis, is more reliable. Doubt of the value of the dermatosis as a sign of vitamin A deficiency has been expressed but without sufficient consideration of the factors involved in the diagnosis and interpretation of the lesions. Highly nonspecific changes such as " dryness," " roughness," and " redness " have been given undue weight. Though frequently found with the characteristic eruption they are only a few among several changes and of little value in themselves. As do other characteristic eruptions, the dermatosis of vitamin A deficiency has features of location, distribution, pattern, size, color, shape, and consistency of the individual lesions which distinguish it from other eruptions. The hyperkeratotic follicle is one of the individual lesions of the vitamin A deficiency dermatosis but a hyperkeratotic follicle, or several of them, is not *the* dermatosis. It is true that at best the dermatosis is not pathognomonic. It is however a sign of considerable reliability and meaning when properly identified. Unfortunately, under the condition of the examination used in this survey the results of the examination of the conjunctivae cannot be so definitely evaluated.

The third feature of particular interest in the results is the lack of correlation and agreement between the various indices or evidences of vitamin A deficiency. Such a lack of agreement might be thought to indicate such a lack of reliability of one or more of the procedures, tests or signs as to impair the value of the survey. Yet, consideration will show, as already stated, that such agreement need not necessarily be found or expected. The intake of vitamin A may fail to accord with the concentration in the blood because there has not been time for the latter to reflect recent changes in intake, particularly when the fluctuations in intake are not greatly above or below the minimum requirements. Only in respect to the rod threshold (adaptometer) might close correspondence be expected with the intake of vitamin A (elevated thresholds may respond promptly to increased intake of vitamin A), but even then good correlation might be obscured by relatively slight changes in vitamin A intake and the effect of subjective error on the detection of slight changes in the threshold. Finally, there is the possibility, for which some evidence is accumulating, that other variables than those previously known or suspected are concerned, in addition to vitamin A, in visual adaptation to the dark (adaptometer).

Correspondence between the symptoms and the physical changes and the intake of vitamin A, the blood concentration of vitamin A, or the adaptometer value is even more unlikely. The symptoms (except night blindness) and physical changes are slow to develop and slow to disappear, requiring weeks or even months and hence often lagging far behind changes in the other indices.

It is necessary therefore, to take these various manifestations, the symptoms, the physical changes, and the laboratory tests as independent signs of a deficiency, differing in their reliability and specificity. Also they have a differing quantitative significance, reflecting variations in the severity and to some extent in the chronicity or duration of the deficiency.

SUMMARY

On the basis of this discussion the

nutrition of the population as respects vitamin A may be summarized as follows: There was a deficient dietary intake of the vitamin in a large proportion of the population according to the standards of sufficiency adopted. This deficiency of intake was not accompanied by a correspondingly high incidence of symptoms or physical signs of a deficiency, only a relatively small number of the subjects exhibiting this evidence of a deficiency. On the contrary, the test of dark adaptation and the concentration of vitamin A in the blood indicated a degree of deficiency somewhat comparable to that suggested by the dietary intake. Reasons are given why test of dark adaptation may not be a reliable measure of vitamin A deficiency, but the concentration of vitamin A in the blood is believed to be a significant index of vitamin A nutrition. It should be emphasized that the manifestations of a deficiency vary at different levels of intensity and duration and according to the definitions of the deficiency.

Neither the deficiency of intake nor the objective manifestations of a deficient nutrition were distributed equally among the various age and sex and racial groups. While the explanation for some of these differences seems quite clear, others are at present unexplained.

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Wartime Problems of a County Health Officer*

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SOME of my wartime problems arise from within my department. Others press on it from without. First, of the inside problems, there is the heavy loss of personnel—to the armed forces, to high salaried jobs in war industry, to better paid employment in other governmental organizations, and, in the case of many of the former women employees of the department, to an easier life at home, where the income of the husband is now enough to make it no longer necessary for the wife to work. Second, for those who stay by the department, most of whom are older and less energetic to begin with than those who have left it, there is the discouraging effect of their low salaries in the face of high living costs, also the general feeling of uncertainty which nobody seems able to overcome, depressing their morale. Third, there is the insistence of some of my ambitious fellow workers that the department adopt new policies and move into new fields whenever anything opens the way.

First, of the outside problems, there are the new projects that certain popularity-hungry people think up and shout about, then look around for some "George," too frequently the health department, upon whom they can throw the burden of doing the work. Second, there are the official visitors who call to find out what we are doing and how we are doing it, and then suggest that we stop doing this or start doing that or change our ways to conform to this or that model, etc. Third, there is the slowness with which tax-supplied funds grow, and the equal slowness with which some of those who control the funds seem to grasp the fact that now is the time when the health department ought to be able to meet new and increasing needs with augmented strength. Lastly—at least the last that I shall mention—there is the public, more upset and more fearful about almost everything now than ever before, and more often and more insistently than ever demanding that the health department "do something about it."

It is unnecessary to discuss in detail all of the problems I have mentioned. In some cases, little more than the brief statement already given is needed to make them clearly understood. In others, it seems best to explain further and to give some examples, duplicates of which, I feel sure, can be supplied from other jurisdictions.

When it comes to fellow workers leaving the department, what else can one do than give his best regards and good wishes to those who join the armed forces? And those who leave to take up high salaried jobs in war industry can hardly be blamed. As to those who go to better paid employment in other governmental organizations, I feel impelled to hold them up to the men who handle the county money bags as an argument for raising salaries. I can hardly expect them to compete with our state at present, because the California treasury has more loose money in it now than at any pre-

* Presented before the Health Officers Section of the American Public Health Association at the Seventy-second Annual Meeting in New York, N. Y., October 12, 1943.

vious time in my recollection. But I look at Los Angeles City, our big neighbor, which has a hard time to find money enough to put concrete patches on an old sewer outfall down in the surf and keep it in operation for a while longer, to say nothing of being able to finance an adequate sewage treatment plant and free those ten miles of our beautiful beaches from quarantine; and I complain loudly: "Why should we pay our nurses less than the City Health Department pays?"

Now, what of those who stay by the department? While there does not seem to be much change possible in the general low salary level in local government, and there is little that can be done to relieve the feeling of uncertainty about what lies ahead, these conditions do present a challenge to me, and, I believe, to the head of any department of local government.

We must support morale by being as sympathetic and human in dealing with our fellow workers as it is possible to be. This is no time for a county health officer to put on the high hat or to tighten the thumb screws.

I can appreciate the attitude of my ambitious associates who see what they consider opportunities for the department to spread out into broader fields. They believe that if we do not occupy these opening fields, somebody else will; and then later we may find our own work disappointingly small and circumscribed. For instance, a year or so ago there was an increasing demand for part-time bedside nursing care in many of our communities. Some of our leading nurses felt strongly that we should begin a bedside nursing service, lest the newly-born Visiting Nurse Association undertake the work and earn the good will that they thought ought to be ours. I did not think we had force enough to attempt it then; and now, with a force of nurses so greatly depleted that we are not even able to maintain the services which we have for many years considered essential, we certainly would find ourselves in a very embarrassing position if we had led the public to believe that we could take on the bedside nursing burden too. It is all right to grow, but not so good to swell.

I wish there were time for a more extended discussion of the merits and demerits of my department's entering further into the field of giving medical care to the people. With regard to what may be done to promote positive health through education about nutrition and desirable health habits, I do not hesitate to urge my department staff to go the limit. And I do not consider myself out of place in promoting general knowledge about common illnesses and simple home treatments for them. In these respects, many of our citizens are not as far ahead as their grandmothers were, and I think public health people are elected to help win back the ground lost on this front and to make still further advances. That, admittedly, is only the fringe of medical care.

I know that many believe the time will eventually come, and perhaps in the not-too-distant future, when the medical care of a considerable proportion of our citizens will be given, or at least organized and supervised, by health departments. I confess to being somewhat slow in moving very far in this direction. In my county, the medical care of the indigent is already set up under the Charities Department, and no department likes to diminish its importance by turning over any considerable part of its established activities to another department. Furthermore, we have the California Physicians' Service and the Group Hospital Plan in operation, and I think these organizations should be given a fair chance to show what they can do. Fundamentally, of course, it is up to the

people to say what kind of medical care they want, who shall give it, organize it, or supervise it, and how it shall be paid for. It is possible that some day organized medical care under government auspices will come into general being, and that by public demand health department doctors will have to take a leading part in it. If that day comes, I of course want to be ready for it.

It is, for this and other reasons, one of my most vital problems as a county health officer to keep in touch with the current of public opinion in my territory, so that I can not only know what is needed and wanted from day to day, but can foresee trends and tendencies to some extent. I should even, within reason, try to mold public opinion; but I should not walk too far in advance of my public. A drum major is an inspiring sight and serves a good purpose marching in front of his band; but he would look silly and be useless prancing up the street two or three blocks ahead.

When it comes to outside problems, I know of no way of heading off people who want to be looked at as saviors of their community in this "time of peril," but who also prefer to have somebody else do the work which their bright ideas make necessary. I shall never forget a remark made by the elderly watchman of the parking lot beside our office building, apropos of local activities, mostly talk, in the early months after Pearl Harbor. He said, "Well, Doc, the trouble with this here business is that there is just too many guys that want to be heroes." It is not always easy for a county health officer to save time enough to attend to his own business in the midst of such conditions without seeming to be uncooperative or even an unpatriotic obstructionist.

I am happy to say that our official visitors, who sometimes come in the flesh and sometimes in the form of pamphlets with imposing titles, and who months or years ago were inclined to be critical of what we were doing and how we were doing it, have more and more come to see that communities differ, and that each one must settle its questions and do its work more or less in its own way if it is to be done to the best advantage.

One lasting memory, however, is the way that pressure was applied to my illustrious predecessor to recruit a large force of volunteer sanitary inspectors, the estimated needs running all the way from ten to forty for each of our twelve districts. Under this pressure, an earnest effort was made to find volunteers for such work. We finally succeeded in bringing a few small groups together here and there, but when we started to train them they began to evaporate. Within a few months there was hardly one left. Nobody is trying to tell me now that this plan will work in Los Angeles County.

During the early weeks of my own administration, I was plagued with the proposal that all of my regular inspectors be provided with emergency driving permits and blackout driving lights. They were also to be organized so that they could rush out into the field in case of a bombing raid to take care of food, water, and sewage problems caused by the explosions. Of course I wanted them ready when the raid was over and daylight came to take care of all emergencies that properly fell to them; but just what they would be able to do in the dark with food stocks and water and sewage systems, and with air raid wardens, policemen, firemen, utilities crews, emergency medical squads, etc., swarming around, I was never able to see. Still, I did not know for a while whether or not I could dodge this ill-timed activity without being looked at as next door to a traitor.

As to the county officials who have to estimate the distance to the bottom

of the tax barrel in deciding how much support will be given to the health department, I sympathize with them. They cannot, in many instances, do what they want to do. But they always have *some* leeway, and it is my problem to guess how much time and pressure I should employ in keeping them informed about the changing public health needs of the people, the effect of wartime conditions on our working staff, and how much, under the circumstances, I think they ought to do about these things. If I put on too little pressure, I fail to do my duty. If I put on too much, I succeed only in making myself a nuisance.

Now let us give attention to a perplexed and apprehensive citizenry. I have lost all hope of keeping up with their multiplied appeals, yet must daily take care that I do not become callous to them. The wife of a defense plant swing shifter wants me to keep neighbor A's roosters from crowing and neighbor B's pup from barking, so her husband can sleep. One dog lover wants me to sponsor an ordinance that will insure a type of inspection of animals slaughtered for pet food as good as that which is available in packing houses producing meat for human consumption; for, you see, wartime conditions have resulted in a poorer quality of dog food on the market.

One wants me to make the organization of sanitation districts my immediate purpose and chief aim in life. Every few days he comes in and repeats his arguments: Will not the lack of sewers breed filth? Will not filth breed epidemics? Will not epidemics ruin the country that the boys on Guadalcanal are dying to save? Another wants me to rid his chicken farm of rats. Are not rats a plague menace?

Dozens—one or more almost every day in the summer months—insist that I do something about the mosquito pest. It is hard to describe the feeling of weariness and frustration that results from having to explain over and over during the mosquito season that, in California, state laws specify that mosquito control shall be carried on under the Mosquito Abatement District plan, and that the health department cannot legally spend money on it, especially when one knows that many of the complainants suspect the explanation is only a "brush off." To get around this point, one citizen insists that the mosquitoes in and around his home are the kind that can carry malaria, therefore I should exterminate them as a means of preventing the spread of communicable disease. When several of them are caught, and identified by the best authority in the West as not being anopheline at all, let alone being malaria vectors, he does not act as if he is yet convinced; and I have no doubt that he thinks, and perhaps tells his neighbors, that the health officer is neglecting his duty.

Then there is the poor lady, sensitive to oleander blossom pollen, who thinks the bulk of disease in many parts of the county is due to oleander poisoning. She asks me if it is not as important to head up a campaign to destroy all the oleander bushes in the county as it is to be concerned about the increasing prevalence of rabies.

But time makes me put a stop to this account, though there is no end to the story. I have to confess to being a poor drum major, with a band that I can seldom keep either in step, in time, or in tune. Still I resolve to trudge persistently along waving my health baton, with both ears and one eye on the band to keep it in plain sight and hearing, and the other eye on the road ahead. Without that forward look, both the band and I would probably fail to make the right turns when the time came, and eventually find ourselves lost in some pseudo health street with a dead end.

Procurement and Assignment—The Industrial Hygiene Problem*

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WHEN the United States entered the war there was a bank of some 300 trained industrial hygiene personnel, exclusive of physicians. Many of these have been absorbed by the military forces, the U. S. Public Health Service, the Maritime Commission, and other federal agencies, as well as by state and local bureaus of industrial hygiene. These agencies are not at present recruiting industrial hygiene personnel. However, should they need any, applicants will be cleared through the Procurement and Assignment Service for Sanitary Engineers of the War Manpower Commission.

This service is now operating under a definition of essentiality which is designed to assure state and local industrial hygiene agencies one industrial hygiene engineer for less than 500,000 of labor population, two for 500,000, and one more for each additional 500,000. This may or may not assure a sufficiency of service. Regardless of that, the pressing problem of the war industries, in so far as industrial hygiene is concerned, is not in the official agencies and in the services that they can render but in the industries themselves.

Prior to the war there were not too many in-the-plant industrial hygiene engineers. The expansion in personnel had occurred mostly in the state and local official agencies and this was stepped up greatly by the declaration of war. When industry sought to employ them, trained and experienced persons were not available. A training program was attempted but it failed to progress much beyond that which was developed by the Division of Industrial Hygiene of the National Institute of Health, which did not increase the availables for industry.

So, except for the services supplied by the official agencies, the industrial hygiene activities of industry have been, with some few exceptions, and will be, definitely curtailed for the duration. The help of the official agencies is valuable and, of course, it is appreciated. But limited in personnel as they are by the definition of essentiality, their services to industry must necessarily also be limited—exceedingly so. These agencies cannot give day to day service, nor can they follow through. They can make surveys and they can counsel with industry; but the war industries need more than that to maintain control over exposures.

Concurrently with these developments have come further changes and additions in occupational disease laws, making them more stringent and inclusive. Industry has attempted to meet the situation after a fashion. Plant physicians, nurses, chemists, and safety men have picked up practical information with respect to certain exposures peculiar to their plants and with the aid of official agencies they have done quite well. The safety people have been especially interested and active

* Presented before the Industrial Hygiene Section of the American Public Health Association at the Seventy-second Annual Meeting in New York, N. Y., October 14, 1943.

and they have done very well indeed, particularly in the prevention and control of air contamination.

In view of the foregoing, the Michigan Industrial Hygiene Association has deemed it wise to encourage and improve this lay assistance, and in doing so, special consideration is now being given to safety personnel. The most notable effort in this direction is now being projected at the request of the Industrial Hygiene Association by the School of Public Health of the University of Michigan. The first move is an " In-Service Training Course in Industrial Hygiene for Plant Safety Personnel " at Ann Arbor, during October, 1943. There appears to be a sufficiency of importance in the course to warrant a rather complete description.

It is planned to be a course of instruction, not a convention or a conference. A special faculty group is brought together for the occasion, composed of speakers who are recognized authorities. Each has been chosen for his familiarity with certain industrial problems, his contacts with plant safety personnel, and his capacity for practical application of technical information, as well as knowledge of the subject he will discuss. While the course will consist of a series of lectures by different speakers, it will provide continuity of instruction, with special bearing on environmental control procedures concerned with the prevention of occupational diseases and their implementation by safety people.

Although the course is for safety personnel, some physicians have registered and will be in attendance. However, there will be no discussion of industrial medical, nursing, and accident prevention procedures. If there seems to be a demand for this type of instruction, and there appears to be already, it will be handled in subsequent courses.

Supplementing the lectures there will be a group of informative educational exhibits on: (1) Protective clothing; goggles, respirators, and other commonly used protective devices. (2) The instruments and equipment used by industrial hygiene engineers in making environmental surveys. (3) Simple, but effective, home-made goggle-cleansing, and boot and glove-cleansing stations used in certain plants.

The subjects to be discussed are:

Significance of Industrial Hygiene
Relationship of the Safety Engineer to Industrial Hygiene
Environmental Aspects of Industrial Hygiene
Control of Solvent Vapors and Acid Mists
Control of Smokes, Fumes and Gases
Evaluation and Control of Dust
Safe Operation of Solvent Degreasers
Foundry and Forging Practices, Moulding, Core Making, Shake-out, Cleaning, Heat Treating, etc.
Metal Finishing, Machining, Grinding, Welding, Plating Metal Cleaning and Painting, etc.
Plastics, Formaldehyde, Resins, Impregnation, Curing Fabrication, etc.
Industrial Ventilation Practices
Applications and Limitations of Respiratory Protective Equipment
Personal Protective Clothing and Equipment
Causative Agents of Industrial Dermatitis
Dermatitis Preventive Measures
Modelling of Women's Protective Clothing
Legal Interpretation of the Recent Modifications of the Michigan Workmen's Compensation Act
Plant Sanitation
Maintenance and Its Relation to Safety and Health
How to Make a Survey for Health Hazards
How to Sell Industrial Hygiene to the Worker
How to Utilize the Resources of Official and Private Industrial Hygiene Agencies

SUMMARY

The industrial hygiene problems of Procurement and Assignment are now limited largely to industrial plants. New well trained personnel are not available. Industry is temporizing with lay assistants and thinly spread help from the official agencies. Safety personnel have become interested and are doing very well. A special course for their instruction has been discussed.

American Journal of Public Health
and THE NATION'S HEALTH
Official Monthly Publication of the American Public Health Association

Volume 34 April, 1944 Number 4

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DDT

ONE of the gravest health problems which will confront our Armies of Occupation in Europe (a problem already encountered in the Naples area) is the threat of typhus fever. The dislocation of populations, the lack of soap and of fuel for heating water, and the contributory influence of malnutrition will certainly confront us with the same situations which arose in the retreat of Napoleon's armies from Moscow and in the years of the Russian Revolution and the mass migrations which followed the First World War.

Fortunately we have at our disposal new control methods which are infinitely more powerful than those we possessed a quarter of a century ago, in the cumbersome procedures of heat disinfection (the Serbian barrel, for example) or the mass treatment of clothing by gaseous disinfectants.

Early in 1941, the Preventive Medicine Service of the Surgeon General's Office of our Army began an intensive study of insecticides and insect repellents; the exhaustive investigations made in the last two years have indicated the remarkable potency of dichloro-diphenyl-trichloroethane (DDT). This substance, synthesized by a German chemist in 1874, was suggested by a Swiss chemical firm in 1939 as an insecticide to be used against moths and plant lice. In May, 1943, DDT was adopted by the Army as the standard louse powder. One application of this powder is effective for 3 to 4 weeks, unless the powder is removed by washing. It can be applied by hand and power dusters without removal of the clothing. It is also possible to impregnate underwear with DDT; and in preliminary tests such underwear has retained its effective power for 7 to 8 weeks, even though washed once a week during that time.

All available DDT is now needed by the armed forces and present production is only sufficient to permit its use as a louse powder.

The efficiency of DDT in combating mite-borne typhus (scrub fever and the like) has not yet been revealed. So far as the classical European typhus is concerned, however, it seems that a phenomenally efficient control procedure is now available.

STREPTOCOCCOSIS

ONE of the most interesting developments of modern medicine is a recognition of the difference between a pathological classification of disease on the one hand and an epidemiological classification on the other. The same germ may produce two quite different clinical disease entities; and the same disease may be caused by quite different etiological agents.

Such a situation has been revealed by recent studies of diseases caused by the hemolytic streptococci. It has been shown that such diverse pathological conditions as scarlet fever, erysipelas, tonsillitis, cervical adenitis and otitis media may be caused by identical or closely related organisms [1]; and Sidney Sinclair has suggested the term " streptococcosis " as a useful designation for the entire etiological group.

To avoid a tendency to undue simplification, it should be remembered that other investigators have recorded notable differences between individual streptococcal types in their tendency to produce a particular clinical picture. In a Naval Training Station, it was shown that Types 1 and 6 are generally associated with pharyngitis and tonsillitis, Types 3 and 19, with scarlet fever.[2]

Nevertheless, it is clear that a single type of streptococcus may—at the same time and in the same family—produce diseases as diverse as scarlet fever, sore throat, erysipelas, and otitis media. Such a situation offers a direct challenge to our conventional practices of isolation and quarantine. A more or less typical state sanitary code provides that scarlet fever shall be isolated for at least 21 days from onset and streptococcus sore throat only during the clinical course of the disease; while erysipelas and otitis media are not mentioned at all. Even our Committee on the Control of Communicable Diseases calls for the isolation of scarlet fever for 21 days " if medical inspection is not available " and for quarantine of exposed children and teachers from association with children and food handlers from their work until 7 days after exposure; while, in the case of septic sore throat, isolation is during the clinical course of disease and convalescence and no quarantine is called for.

It seems somewhat fantastic that of three people in the same family, all infected with the same etiological agent and all equally able to disseminate that agent, one (with a rash) should be isolated for 21 days, one (with a sore throat) during illness, and the third (with a discharging ear) not at all.

The problem is clearly a difficult one. The diagnosis of " scarlet fever " must clearly be maintained for comparability with past statistics, however much or little it means from an epidemiological standpoint. The term " septic sore throat " in our lists of reportable diseases can easily be broadened by adding the words " and other diseases of the upper respiratory tract caused by hemolytic streptococci." Should other forms of streptococcosis also be included in our regulations for isolation and quarantine? Should the isolation period for scarlet fever—as well as for its allied diseases—be based on the disappearance of the causative organisms rather than on an arbitrary time limitation? Are not our present procedures too harsh in the presence of a rash and too lax in its absence?

It seems clear that this subject offers one of the most important challenges to the public health administrator of the future. Streptococcal infections probably rank next after tuberculosis, influenza, pneumonia, syphilis, and " the common cold " in the order of importance of current communicable diseases in temperate climates and in areas of relatively high economic status. We need more intensive

typing studies such as those of Schwentker and his associates; we need expansion of public health laboratory services for the diagnosis and release of streptococcal infections; and we need open-mindedness on the part of administrative and code-making bodies, with a readiness to modify the standard procedures of the past in the light of the new knowledge of the future.

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FRIENDS OF THE SLUM

IT has often been pointed out that the social issues involved in our future public health program are more controversial than the earlier problems which related to the control of microbic diseases. "The diphtheria germ has no friends; but the insanitary tenement has powerful allies." The friends of the slum have rallied to its defense during the past year.

The Second Realtors War Conference, the National Association of Real Estate Boards, the National Association of Home Builders, and the United States Savings and Loan League have joined in a concerted attack on public housing which has found its first concrete expression in an organized and heavily financed attack on the National Capital Housing Authority of Washington, D. C.—an assault which has been frankly described as a "pattern" for similar onslaughts on the housing movement throughout the nation. The announced platform of this group is that public housing has been a failure, that no more public housing should be undertaken, and that the housing now controlled by local or federal governmental agencies should be turned over to private enterprise. These champions of the principle of individual initiative are quite willing to have the government buy up the slums at their present inflated values, provided that the land is then turned back to private enterprise. They propose that the needs of the lower income groups be met by means of "rent certificates" issued to individual families through local welfare departments. They state that such certificates must not be used to perpetuate slum conditions; but they do not indicate how such a desirable result can be attained under the plan proposed.

The misrepresentations and fallacies involved in this attack on public housing have been fully and convincingly exposed in Nathan Straus' *Seven Myths of Housing*, reviewed in this issue of the JOURNAL. The strange feature of the situation is that the thinking of this pressure group—presumably representing the considered judgment of business men—moves in a field of sentimental and emotional abstraction and ignores the practical economic facts of the situation.

These facts may be summarized in the form of two main conclusions, both amply verified by economic theory and practical experience. The first of these conclusions is: that no social purpose can be attained by clearing present slums unless and until some other more adequate homes are provided for the present slum dwellers. The health officer knows well that if all the substandard dwellings in a given community were suddenly eliminated, a considerable section of the population would be sleeping in the streets. Therefore, the provision of good homes must go forward hand in hand with the demolition of bad homes.

Second: that the provision of adequate dwellings for the lower income group can only be accomplished by governmental construction of such dwellings for

rental at a figure which the prospective occupants can pay. A substantial proportion of the population—even in 1929, the peak year of peacetime prosperity—had family incomes too low to permit the payment of an economic rent for decent dwelling facilities. Obviously private capital, which rightly and properly operates for a profit, cannot serve this group. Only the people as a whole—actuated by the conviction that decent homes form an essential factor in good citizenship—can fill the gap. It has begun to fill it successfully and economically under the Federal Housing Act of 1937.

The tragic part of this whole controversy is that there is really no conflict at all between public and private housing. Public housing recognizes that at least two-thirds of the homes of the future must and should be built by private capital and that this area of business initiative should be broadened as far as possible by application of new building technologies and sound modern methods of financing. Public housing begins only at the point where private housing is unable to meet our needs.

It is quite possible that the well financed propaganda of the special-interest groups mentioned above will gain local and temporary successes. Of the ultimate triumph of the public housing program we can rest assured. The American people have common sense enough to see that the public purchase and clearing of slum areas, without the provision of adequate housing for the lower income group, can have no effect except to assure speculative real estate owners of profit on swollen urban land values; and that the " rent certificate " can only (as in the past experience of welfare allowances for rent) continue to perpetuate slum conditions; or else provide government grants so large as to cover not only basic costs but also a margin of profit to the entrepreneur; or more probably both. The opponents of public housing object to " concealed subsidies "; but, in effect, they propose new and vast concealed subsidies—to be paid—not to the low-income families who need and deserve aid—but to private real estate interests which are supposed to function on the basis of free competition.

We believe that the vast majority of our fellow-citizens engaged in real estate and allied financial businesses believe in free competition and desire no government aid in the field in which business initiative can function; and that they also recognize the need for government action in the interest of American equality of housing opportunity for the children of those whose economic status does not furnish the possibility of legitimate private profit. They are sadly misrepresented by those of their leaders who are engaged in an attempt to block the progress of a sound and essential public movement and to secure from the public treasury special advantages for the same minorities which have created our present slums and now desire to perpetuate them and recreate them as sources of exploitation.

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Methods of Counting Bacteria in Dairy Products—A. H. Robertson, Ph.D., State Department of Agriculture and Markets, Albany, N. Y.

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Methods for Detecting Organisms of the Coliform Group—A. J. Slack, M.D., Institute of Public Health, London, Ont.

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Microbiological Methods for Examining Butter—Harold C. Olson, Ph.D., Oklahoma Agricultural and Mechanical College, Stillwater, Okla.

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Methods of Examining Milk for Evidences of Brucella Infection—I. F. Huddleson, Ph.D., Michigan State College, East Lansing, Mich.

Methods of Examining Milk for Tubercle Bacilli—William A. Hagan, D.V.M., U. S. Department of Agriculture, Washington, D. C.

Methods of Identifying Streptococci in Dairy Products—George J. Hucker, Ph.D., New York State Agricultural Experiment Station, Geneva, N. Y.

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Sectional Committee on Building Code Requirements for Light and Ventilation
Rollo H. Britten
C.-E. A. Winslow, Dr.P.H.

Sectional Committee on Minimum Requirements for Plumbing and Standardization of Plumbing Equipment, A-40 and Subcommittee No. 1
M. Warren Cowles
Sol Pincus, C.E.

Sectional Committee on School Lighting
Leonard Greenburg, M.D.
Joel I. Connolly, alternate

Sectional Committee on the Safety Code for Industrial Sanitation in Manufacturing Establishments
Leonard Greenburg, M.D.
Kenneth E. Markuson, M.D., alternate

Ventilation Code
Earle B. Phelps

Commission for the Study of Biological Stains
William D. Stovall, M.D.

Joint Committee on Definition of Terms Used in Water Works Practice (Joint with the American Society of Civil Engineers and the American Water Works Association)
Earle B. Phelps, *Chairman*
Sol Pincus, C.E.
Ralph E. Tarbett, C.E.

National Conference for Coöperation in School Health Education
Ira V. Hiscock, Sc.D.

National Council on Rehabilitation
Don W. Gudakunst, M.D.

National Conference on Uniform Traffic Accident Statistics
Robert J. Vane

National Health Council
Reginald M. Atwater, M.D.
Louis I. Dublin, Ph.D.
E. L. Stebbins, M.D.

National Nutrition Advisory Committee
Robert H. Riley, M.D.

National Safety Council—Home Safety Advisory Committee
Edward S. Rogers, M.D.

National Technological Civil Protection Committee
Abel Wolman, Dr.Eng.
Arthur E. Gorman, alternate

BOOKS AND REPORTS

The Seven Myths of Housing—*By Nathan Straus. New York: Knopf,* 1944. 320 pp. Price, $2.75.

Mr. Nathan Straus, a life-long friend of housing, who has served as member of the New York City Housing Authority and as Administrator of the United States Housing Authority, has prepared a distillate of his long experience in a form which is particularly timely and important at the present moment. The "Seven Myths of Housing" which he discusses are as follows:

1. "There are no slums in my town"; every health officer knows the answer to this one.

2. "Public housing does not clear slums"; during the first your years of our federal housing program more than 78,000 unsafe or insanitary dwellings were eliminated, about half on the site of new projeects and about half in accordance with the law which calls for the elimination of an equivalent number of substandard dwellings when a new housing project is built on relatively unoccupied land.

3. "The government should buy up the slums"; the elimination of existing slums without providing new housing within the means of slum tenants might be very profitable to the real estate interests, but would in no sense improve the housing of the people. Only the construction of new low-rent homes will make the elimination of slums socially possible.

4. "Public housing is costly and extravagant"; the actual construction of the United States Housing Authority homes has cost one-quarter less than the average cost of similar housing produced by private enterprise. Mr. Straus gives an admirable analysis of the various factors which enter into rent, including actual construction costs, costs of dwelling equipment, architects' fees and overhead charges, cost of land, cost of utilities, taxes, operation, and upkeep.

5. "Public housing does not rehouse families from the slums"; that this is untrue is indicated by the fact that over 90 per cent of the families in public housing projects have family incomes of less than $1,200, which indicates that without federal aid they cannot live anywhere except in the slums.

6. "The slum dweller creates the slums"; experience in housing management fully demonstrates the fallacy of this assumption.

7. "Public housing injures private business and threatens to bankrupt the country"; public housing cannot injure private business, since no tenant is admitted unless his income is too low to purchase housing for an economic rent and unless he is living in an insanitary and substandard dwelling; a comprehensive and effective public housing program has not "bankrupted" England or Holland or Sweden, and it is not likely to "bankrupt" us.

Mr. Straus outlines a post-war goal of 900,000 new dwellings a year, of which about one-third should be low-rent housing provided by government subsidy, the other two-thirds to be built by private enterprise, with some government assistance in the middle income groups.

This is by all odds the best book on the philosophy of public housing now available. It should be on the desk of every health officer or other public health worker who wishes to be prepared to take an intelligent stand in regard to this vital health issue of the future.

C.-E. A. WINSLOW

Civilization and Disease — *By Henry E. Sigerist. Ithaca, N. Y.: Cornell University Press,* 1943. 255 pp. Price, $3.75.

This book is an excellent illustration of the thesis stated by Dr. Sigerist as follows:

> The historian is a member of the society in which he lives, sharing its hopes and fears, its aspirations and frustrations. Driven by a burning interest, by an overpowering urge, he sets out to consult the past—not the past at large, but a certain period, a sequence of events, personalities or problems. He wants to know what things were like, and to this end he assembles all the documents he can find. They become sources to him; he questions them, makes them talk, tries to understand and interpret them. Gradually a period, events, people of the past long dead become alive to him, an experience which he wants to share with others through the living word and in literary form. He recreates the past and by so doing makes the writing of history an artistic process.

In the present volume he discusses such subjects as civilization as a factor in the genesis of disease, and the interrelationships of disease with history, economics, law, religion, philosophy, science, literature, art and music.

In reading the present volume one has the sensation of sitting before an open fire with a pipe or a cigar and a decanter of port, listening to the conversation of a charming companion full of ancient lore and modern wisdom. The fascinating illustrations from medieval sources add greatly to its interest.

The health officer may question whether masks really proved effective during the influenza epidemic of 1918–1919 and might object to the statement that "since organic material decomposes it provides breeding ground for parasites which are a menace to man." To some of us it seems strange that Fracastorius and Kircher are not mentioned in connection with the history of the germ theory of disease, and that Sanctorius does not find place with Harvey among the pioneers in experimental physiology.

These would, however, be merely carping criticisms of a sound and scholarly and fascinating work. It is not intended as a textbook and it does not follow any special logical order, but there is a connecting link through nearly all the chapters, in Dr. Sigerist's emphasis upon the fact that

> . . . the task of medicine is to promote health, to prevent disease, to treat the sick when prevention has broken down and to rehabilitate the people after they have been cured. These are highly social functions and we must look at medicine as basically a social science. Medicine is merely one link in a chain of social welfare institutions that every civilized country must develop. If we have a maladjustment today, it is to a large extent due to the fact that we have neglected the sociology of medicine. For a long time we concentrated our efforts on scientific research and assumed that the application of its results would take care of itself. It did not, and the technology of medicine has outrun its sociology.

The closing paragraph of the epilogue which refers to the present world crisis is heartening:

> The more I study history, the more faith I have in the future of mankind, and the less doubt as to the ultimate result of the present conflict. The step will be taken from the competitive to the coöperative society, democratically ruled on scientific principles, to a society in which all will have equal duties and equal rights, not only on paper but in fact. We may not see it, but our children or their children will. While we are struggling, the foundations are being laid for a new and better civilization.

C.-E. A. WINSLOW

Twenty Years of Medical Research—*By Dorothy White Nicolson. New York: National Tuberculosis Association,* 1943. 97 pp. Price, $.50.

Nowhere has medical research taken a more varied pattern than in these United States during the past forty years, and at no time since the "Golden Age of Bacteriology" has the development of basic scientific knowl-

edge been more rapid. Though a majority of the outstanding contributions have been the work of talented individuals, often working independently, the growing complexity of the natural sciences has inevitably led to an increasing interdependence of investigators. It was recognition of the need of utilizing the resources of the allied sciences, as well as those of medicine, in broadening our basic knowledge of tuberculosis, that governed the Committee on Medical Research of the National Tuberculosis Association in determining its policy in 1920. This policy has been to encourage and assist a few investigators whose work promised to bridge to some extent an existing gap in our knowledge of tuberculosis or to provide more effective methods of diagnosis or treatment.

How wide a field has been covered by the researches of the following twenty years is indicated by a list of 21 projects supported by 35 grants. The projects have covered such diverse fields as Snow's classical study on the "Anatomy of the Lungs," coöperative studies on the chemistry of the tubercle bacillus and improvements in x-ray technic. That the results of the studies sponsored by this Medical Research Committee rank among the leading contributions to our knowledge of tuberculosis during the past two decades will be generally recognized by tuberculosis workers. Perhaps an even greater contribution is the demonstration of the possibilities of coördinated effort among investigators in medical science, for only by such coöperation can the necessary knowledges and technics of modern science be brought to bear upon a given problem. The effective application of this method calls for long-time planning and over-all supervision, and credit for the accomplishments of the National Tuberculosis Association's research program belongs in no small part to the Research Committee who, under the continued chairmanship of Dr. William Charles White, has encouraged and directed the twenty years of effort. For the student of tuberculosis the detailed bibliography gives convenient access to all individual reports of investigations associated with the committee's research program. ALTON S. POPE

Administration of Relief Abroad —*A Series of Occasional Papers, Edited by Donald S. Howard, Russell Sage Foundation* (130 East 22nd Street, New York 10). Price, $.20 each, or $1.50 for the set of eight.

The Near East Relief, 1915–1930, by James L. Barton.

The American Red Cross in the Great War, 1917–1919, by Henry P. Davison.

American Aid to Germany, 1918–1925, by Sidney Brooks. Together with *The Long Mile Beyond Berlin*, by Shelby M. Harrison.

The American Friends Service Committee in France, 1917–1919, by Rufus M. Jones. Together with *Problems Involved in Administering Relief Abroad*, by Clarence E. Pickett.

The American Relief Administration in Russia, 1919–1925, by H. H. Fisher.

Recent Operations of the American Friends Service Committee in Spain and France: Operations in Spain, 1937–1939, by John Van Gelder Forbes. *Operations in France, 1941–1942*, by the American Friends Service Committee.

American Red Cross Famine Relief in China, 1920–1921, from the Report of the China Famine Relief, American Red Cross.

Foreign Relief and Rehabilitation—A Bibliography, compiled by Sigrid Holt.

There was a world war twenty-five years ago which was widespread and terrible enough at the time. The

sympathy and funds of this country were poured out in efforts to repair some of the damage to human beings. Smaller disasters since have met with like response. The seven books listed were, fortunately, published by the different groups to inform the public who had supported the work.

Today suffering even more widespread is calling for plans for immediate and post-war relief. Effective administration is essential. Those who will share in this work, either in planning or in the field, will find these booklets very valuable.

They are case records. Each is a digest of the book abstracted, in one-tenth the size, using a current technic. Together they enable the reader to study the widely varied methods of the different groups, and profit by their experiences. With them should be read the report of the Atlantic City conference of the United Nations last fall. A new framework is appearing.

Clarence E. Pickett's remarks, at the close of Rufus M. Jones's book, combine sound views with a sense of the spirit that quickeneth.

One question comes to the reviewer. If height-weight tables are now out, what tool will the workers in nutrition give us today with which to select children for special feeding?

Perhaps the Russell Sage Foundation will add to our debt by binding this "First Series" under one cover.

HENRY R. O'BRIEN

Orthopedic Nursing — *By Robert V. Funsten, M.D., and Carmelita Calderwood, R.N., A.B. St. Louis: Mosby,* 1943. 602 pp. Price, $3.75.

This volume represents an approach to combined medical and nursing consideration of the care of patients with orthopedic conditions. It is presented by a physician and a nurse in a manner which will meet a long felt need of the nursing profession.

The introductory unit emphasizes the need for clearer understanding of the orthopedic content of all types of illness, as well as the relationship between body mechanics and posture and the efficiency of normal activity. In the second unit are grouped several chapters dealing with nursing care of cast and surgical patients, description and explanation of the use of orthopedic linens and restraints, and a general discussion of the responsibility of nursing in relation to physical therapy service.

The remainder of the book is divided into units in each of which related orthopedic conditions are grouped. The authors give excellent support to each other in presenting from the medical standpoint information necessary to the intelligent nursing care of orthopedic conditions, and from the nursing standpoint procedures necessary to the successful outcome of medical or surgical care instituted by the physician. Throughout the discussion of nursing responsibility emphasis is placed upon prevention and the part the nurse may play in this.

Orthopedic Nursing should prove valuable to both institutional and public health nurses giving care to orthopedic patients, and to all nurses who are interested in reducing the volume of preventable disabilities.

FLORENCE L. PHENIX

An Introduction to Foods and Nutrition—*By Henry C. Sherman and C. S. Lanford. New York: Macmillan,* 1943. 292 pp. Price, $2.00.

This book is a simple textbook on nutrition. It attempts: "first, to indicate the personal and public importance of the present-day knowledge of nutrition; second, to summarize with the greatest possible clarity and conciseness the needs of normal nutrition in terms of the accepted 'yardstick'; third, to introduce in an adequate manner the articles and types of food through which

our nutritional goals are to be reached; and finally to make this unified knowledge of foods and nutrition a functional part of household management and of family life and thought." Appendix A gives the approximate average nutritive values of 100 g. (edible portion) of several more common foods; appendix B is a simple glossary.

This book can be understood by anyone interested in nutrition. It is the simplest of Dr. Sherman's texts on nutrition but maintains the same high standards of his previous books.

FREDRICK J. STARE

Heart Disease Is Curable—*By Peter J. Steincrohn, M.D. New York: Doubleday Doran,* 1943. 193 pp. Price, $1.98.

The great advances being made by medicine and allied sciences have created a growing demand for popular books on specific diseases and their cure. It is only natural that people are curious about heart diseases, for they rank high as killers and make invalids of millions. The author of *Heart Disease Is Curable* has set himself the task of enabling people to satisfy their curiosity by writing a readable volume on the subject.

Many cardiologists and public health workers may be surprised by the title of the book, and justly so. While Dr. Steincrohn's text is consistent with his own definition of "curable," the phrase is misleading, since at the present time most diseases of the heart are not "curable" in the generally accepted sense of that word. It is also questionable as to what extent a book designed for the average layman should go into technical matters of diagnosis and treatment. For instance, in Chapter VII methods of treatment are presented which do not apply to all cardiac patients—"Sodium salt is eliminated from the diet as this tends to keep fluid in the tissues." Such instructions are not properly the content of a book for popular consumption. The author's recommendations in regard to frequent periods of rest and retiring from gainful activity are not possible except for those in the upper economic brackets, and at times may not be possible for them. There is no recognition of the difficult economic problem faced by the average wage earner with heart disease.

The psychological approach of the book is good. It places the patient in a happy frame of mind, particularly Chapter II, "Your Doctor Is Not a Bogeyman," and Chapters IX and XIII which, if condensed, would make a good pamphlet on heart disease.

DAVID D. RUTSTEIN

Biochemistry of the Fatty Acids—*By W. R. Bloor. New York: Reinhold,* 1943. 387 pp. Price, $6.00.

The subject of this book is indicated by the following quotation from page 286: "The whole of our knowledge (of the subject matter of the book) at present constitutes a picture puzzle of which only a few parts are available. Nevertheless, it is interesting and instructive to try to fit these parts together to get some idea of what the complete picture might be."

The greater part of the book is a scholarly and soberly critical summary of the enormous literature (about 1,770 citations) of which the above "few parts" are composed. Otherwise the book consists of stimulating interpretations which verify the correctness of the second sentence in the above quotation.

The composition of the book is indicated more specifically by its chapter headings, of which there are six as follows:

1. Chemistry: Descriptive and Analytical
2. Digestion and Absorption
3. Lipids of the Blood
4. The Lipids in Tissue
5. Lipid Metabolism
6. The Lipids of Secretions and Excretions

The book was apparently written for biochemists and physiologists rather than for clinicians or for commercial fat and oil technologists. However, members of all of these professions will find the book interesting, stimulating, and helpful.

Congratulations are due to the author for his excellent English, which adds to the readability and usefulness of the Book. O. S. RASK

Health Instruction Yearbook, 1943 —*Compiled by Oliver E. Byrd, Ed.D. Foreword by Ray Lyman Wilbur, M.D. Stanford University: Stanford University Press,* 1943. 308 pp. Price, $3.00.

This yearbook is the first venture in what is intended to be a new project, namely, annual preparation of such books. The book is divided into twenty chapters which deal, respectively, with health as a social accomplishment; health as a social problem; nutrition and health; excretion and health; exercise and body mechanics; fatigue and rest; mental health and disease; heredity and eugenics; infection and immunity; chronic and degenerative disorders; habit-forming substances; the care of special organs; safety; health and physical environment; health services and facilities; family health; school health; occupational health; community health services, trends and probabilities.

The book is composed of brief excerpts taken from a wide variety of sources and grouped in chapters under the topic headings already listed. Taking Chapter VII, on Mental Health and Disease as an example, one finds in this chapter an item on national morale; one on war service and mental hygiene of the young-age group; another on mental health and the war in Germany and Britain; one on mental health and military service in the United States; one on a new type of homesickness encountered in the Navy; one on war fears in soldiers; a Census Bureau estimate of the number of patients in mental hospitals in the United States; some material on psychological weapons of war; a Census Bureau report on suicides in the United States and one on killings in America; an article on recreation and mental health, and one on mental hygiene in industry.

Each of the items is numbered, beginning with 1 and ending with 300 at the end of the last chapter. Bibliographical references are grouped at the end, which causes an endless amount of paging back and forth when these sources could have been listed just as well in immediate juxtaposition to the item.

Regardless of minor defects in the present volume, it represents a worth while endeavor and one which public health workers, especially those in health education, might hope to see continued year by year. Necessarily it is a collection of miscellany, but such a collection if well selected can be of the utmost value, since it may become a repository for the hard-to-find items which every health educator needs to enliven his material and which so often remain elusively just outside of memory's grasp.

In subsequent editions, however, it would seem that a better dating should be placed upon the book. This book is dated 1943, yet it was published in October and must have been compiled early in the year. Most of the references bear a 1942 date and a few are dated in 1941. This is really a 1942 yearbook issued in 1943. Before the series is any older this matter of dating should be rectified.

As for the author's judgment in selecting items for inclusion, that is hardly subject to criticism, since it is his judgment, which some readers will approve and others will disapprove. It will always be so.

As a source book this volume, especially if the series is continued as proposed, should find a place in every health educator's library.

W. W. BAUER

Notable Contributions to the Knowledge of Syphilis—*By Herman Goodman, M.D. (First Limited Edition.) New York: Froben Press,* 1943. 144 pp. Price, $3.00.

The author's introduction to the book is entitled "The Development of Medical Science Stressing Knowledge of Syphilis," which is a more appropriate title. Many of the pre-Columbian personalities mentioned were not notable contributors to the knowledge of syphilis but their names are linked in a long chronological chain which "gives the narrative much of its fascination," to quote Dr. Victor Robinson who wrote the foreword.

The author has performed a real service in recording, in one volume of 144 pages, so many data on the historical aspects of our knowledge of syphilis. Conclusions by the author are rightly omitted; each reader can make a more detailed study of the material cited for whatever purpose he has in mind.

Contemporary contributors to the knowledge of syphilis are merely listed by name, in the very complete Index of 720 names.

The assembly of the illustrations and preparation of the biographical and other data, as well as the citing of references to more complete discussion of various phases of the knowledge of syphilis, has been a task of great magnitude. The 143 illustrations are photographs or pre-photographic era drawings of the persons mentioned. Only two or three of those represented by pictures are now living.

The volume is useful as a source or reference book for libraries, and anyone interested in the historical phases of the development of the present knowledge of syphilis.

C. C. PIERCE

Nurses' Handbook of Obstetrics—*By Louise Zabriskie, R.N., and Nicholson J. Eastman, M.D. (New 7th Ed.) Philadelphia: Lippincott,* 1943. 714 pp. Price, $3.25.

The seventh edition of this textbook, completely revised and newly illustrated, comes at an opportune moment when our birth rate is high and mothers who were never able to afford hospital deliveries or skilled nursing care at home are now able to pay for the best. Nurses are attending more deliveries than in 1935. They are looking for the best and newest knowledge of maternity care and will find in this textbook a satisfactory source of information, as it combines, skillfully and smoothly, the field of public health, institutional and home care, with attention paid to teaching through classes, health educational material, and individuaul conferences. Teachers will find the material already organized for unit instruction, and for the older nurse who wishes to brush off her dusty knowledge of obstetrics—here is the book, with questions for self-examination which reveal the depth of that dust!

A book in its seventh (revised) edition grows richer with age or, to use another simile, cream rises on standing. While no one textbook ever claims perfection and no real student (or teacher) is ever satisfied with a sole source of information on any subject, this textbook shows the effect of many constructive suggestions and reëditing. It is now as comprehensive a reference as a nurse—any nurse—could hope to find in a single volume.

DOROTHY DEMING

A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

RAYMOND S. PATTERSON, PH.D.

Let's Have More Safe Milk—As part of a public works program the suggestion is made that new municipal pasteurizing plants, and additions to present ones, to the tune of $8,000,000 —not counting country pasteurizers— would prevent a lot of milk-borne disease, increase milk consumption, and help get people back to work. Small change, these days, but an important expenditure, for there were 408 milk-borne epidemics involving 16,000 cases in a recent decade.

ANDREWS, J., and FUCHS, A. W. National Inventory of Needs for Sanitation Facilities. Pub. Health Rep. 59, 6:189 (Feb. 11), 1944.

And Safer Drinking Water—Prepared by the Public Health Service, this manual is for the guidance of local health officials to secure greater uniformity and safety in the control of water supplies.

ANON. Sanitation Manual for Public Ground Water Supplies. Pub. Health Rep. 59, 5:139 (Feb. 4), 1944.

Here's a Brave Man for You—Direct treatment of the teeth with fluoride-containing solutions will reduce dental caries. Probably this is a better method than adding fluorine to public water supplies, concludes the writer who adds without any face-saving qualification, "The immediate possibilities for the control of caries are extremely bright."

BIBBY, B. G. Use of Fluorine in the Prevention of Dental Caries. J. Am. Dent. A. 31, 3:228 (Feb. 1), 1944.

New Ideas Department—For a rank layman to annotate a paper of which he understands not a quarter of the words is the height of something or other, but here goes: It seems you take some spleen and rib marrow of a fresh human cadaver, grind the tissues and dry them. This antigen is diluted and injected into animals, much as we do to obtain antibacterial sera. The titer of cytotoxins is determined by complement-fixation. In small doses this anti-reticular cytotoxic serum stimulates the connective tissues of the body to intensify active immunity against all sorts of infections.

BOGOMOLETS, A. A. Anti-Reticular Cytotoxic Serum as a Means of Pathogenic Therapy. (and) MARCHUK, P. D. A Method of Preparing and Preserving Anti-Reticular Cytotoxic Serum. Am. Rev. Soviet Med. 1, 2:101 (Dec.), 1943.

Present-day Pneumonia Experience—Among 90,000 shipyard workers in 1943 there was a pneumonia frequency rate of 9.5 per 1,000. Of 864 patients over 70 per cent had pneumococcal pneumonia. For some of these patients, both serum and sulfonamides were given, the gross mortality being 8.2 per cent.

COLLEN, M. F., *et al.* A Study of Pneumonia in the Shipbuilding Industry. J. Indust. Hyg. & Toxicol. 26, 1:1 (Jan.), 1944.

Had This Occurred to You?—When birth rates vary considerably, the infant death rates, as ordinarily computed, may be no longer accurate, for many infant deaths will be from among babies born during the previous year. Hence a rapidly declining birth rate may produce a fictitiously high infant death rate. This paper suggests how corrective adjustments may be made.

DE PORTE, J. V. Rate of Infant Mortality Adjusted to a Rapidly Changing Birth Rate. Health News (New York State). 21, 5:20 (Jan. 31), 1944.

How Many Have Cancer and What Kinds?—About 4 of every 1,000 city dwelling Americans have, or have had, cancer. About a half million people are under treatment for cancer at any given time, 300,000 new cases being diagnosed each year. Case rates are higher among women and, in both sexes, increase each decade of life. In almost half the males and three-quarters of the females, cancer occurs in either the digestive or genital systems. These are only a few of the arresting answers to our questions.

DORN, H. F. Illness from Cancer in the United States. Pub. Health Rep. (beginning). 59, 2:33 (Jan. 14), 1944.

Care for the Needy Sick—New York State has worked out a practical pattern of public medical care for the needy which supplants archaic "poor doctor" practices, places medical men in charge of medical aspects, and builds a whole new approach to government-physician relationships, in some respects, out-Beveridging the Beveridge plan itself.

DOWLING, L. C. New York State Public Medical Care Program. Pub. Welfare. 2, 2:44 (Feb.), 1944.

Strep Types and Scarlet Fever—All epidemiologists who may be struggling with the problem of controlling streptococcal infections will be interested in the findings of this army experience in which soldiers with pharyngitis-tonsilitis were hospitalized regardless of existence or nonexistence of scarlatiniform rashes. The study of streptococcal types is most revealing.

HAMBURGER, M., JR., *et al.* Ability of Different Types of Hemolytic Streptococci to Produce Scarlet Fever. J.A.M.A. 124, 9:564 (Feb. 26), 1944.

Health Service vs. Medical Practice—Why did you join the local health services? a British M. O. H. asked his colleagues. Nearly half said they joined because of their interest in some specialty. Also nearly half liked the idea of regular hours and fixed salary. A fifth had tried general practice and didn't like it, and 43 per cent believed that they could best serve the community through preventive medicine. A comparative poll of American health officers might produce illuminating comparisons.

JOLLY, R. H. H. The Public Health Service after the War. Pub. Health. 57, 4:39 (Jan.), 1944.

This Paper Is about the Blue Cross—Sanitary engineers, chemists, bacteriologists, inspectors, and educators will view with some curiosity the following resounding and unqualified declaration, "American medicine, American dentistry, American nursing, and American hospitals have given our people the world's finest health service. With respect to education, service, and research, American health service has reached a degree of perfection never realized in any other country on earth." The theme of the peroration is: Everybody in the Blue Cross by 1960.

MANNIX, J. R. Voluntary Non Profit Prepayment for Health Care. J.A.M.A. 124, 9:571 (Feb. 26), 1944.

They Are Still Being Born One a Minute—Medical departments in five industrial plants, widely scattered, conducted a large scale demonstration of the value of cold vaccines, of all sorts, and found no evidence of effective prophylaxis against the frequency or the severity (including complications) of colds. Do you suppose this experience will have any influence upon the makers, the givers, or the gullible receivers of cold vaccines?

MCGEE, L. C., *et al.* "Cold Vaccines" and

the Incidence of the Common Cold. J.A.M.A. 124, 9:555 (Feb. 26), 1944.

One State Is Awake at Any Rate—Brave new plans for an ambitious health and welfare service for the State of Maine should serve to inspire similar agencies to bestir themselves to do something to anticipate post-war health problems in the other 47 states.

PAGE, H. O. Preliminary Statement on Post-war Planning in Health and Welfare. Pub. Welfare. 2, 2:36 (Feb.), 1944.

A Desire to Save Babies Is Needed—Methods employed by the city of Chicago to reduce neonatal deaths are described. Adequate care for premature infants, better obstetrical practice, prevention of infection are the chief infant life saving measures. If they were employed throughout the nation 40 per cent of all infant deaths might be prevented. Three additional papers by Sage, E. C., Torpin, R., and Tyson, R. M., complete this timely and useful symposium. Child hygienists won't neglect this series; many others of us should not.

POTTER, E. L. The Lesson to Be Learned from a Study of Infant Deaths. J.A.M.A. 124, 6:336 (Feb. 5), 1944.

Health for War Workers—War has introduced a host of new chemicals of unknown toxicity and has accelerated the use of older substances known to be hazardous. Modern industry rests on a chemical base and is constantly creating new problems in industrial hygiene. You will recognize the truth in these observations of the joint authors of this paper, if you read it.

TABERSHAW, I. R., and BOWDITCH, M. Industrial Hygiene. New Eng. J. of Med. 229, 27:1003 (Dec. 30), 1943.

BOOKS RECEIVED

CLINICAL TROPICAL MEDICINE. By Z. Taylor Bercovitz. New York: Paul B. Hoeber, 1943. 957 pp. Price, $14.00.

TO LIVE IN HEALTH. By R. Will Burnett. New York: Silver Burdett Company, 1943. 332 pp. Price, $1.96.

MEDICINE AND THE WAR. By William H. Taliaferro. Chicago: The University of Chicago Press, 1943. 193 pp. Price, $2.00.

MANUAL FOR WATER WORKS OPERATORS. By Texas Water Works Short School. Revised edition. Austin, Tex.: Texas State Department of Health, 1943. 392 pp. Price, $3.00.

COSTS OF DENTAL CARE FOR ADULTS UNDER SPECIFIC CLINICAL CONDITIONS. By Dorothy Fahs Beck. Lancaster, Pa.: Lancaster Press, 1943. 306 pp.

A MANUAL OF METHODS FOR ORGANIZING AND MAINTAINING A CENTRAL TUBERCULOSIS CASE REGISTER. By Edward X. Mikol. New York: National Tuberculosis Association, 1943. 70 pp. Price, $1.00.

STATISTICAL REPORTING IN PUBLIC HEALTH NURSING. By Margaret L. Shetland. New York: National Organization for Public Health Nursing, 1943. 56 pp. Price, $.50.

PREPAYMENT MEDICAL CARE ORGANIZATIONS. By Margaret C. Klem. Washington: Bureau of Research and Statistics, 1943. 252 pp.

HANDBOOK FOR THE MEDICAL SECRETARY. By Miriam Bredow. New York: McGraw-Hill, 1943. 253 pp. Price, $2.25.

MEDICAL CARE OF THE DISCHARGED HOSPITAL PATIENT. By Frode Jensen, H. G. Weiskotten and Margaret A. Thomas. New York: The Commonwealth Fund, 1943. 94 pp. Price, $1.00.

DIFCO MANUAL. By Difco Laboratories. 7th ed. Detroit: Difco Laboratories Inc., 1943. 239 pp.

HANDBOOK FOR THE ETIOLOGY, DIAGNOSIS AND CONTROL OF INFECTIOUS BOVINE MASTITIS. By Ival Arthur Merchand and R. Allen Packer. Minneapolis: Burgess Publishing Company, 1943. 66 pp. Price, $1.25.

SAFE CONVOY. By William J. Carrington. New York: Lippincott Company, 1943. 256 pp. Price, $2.50.

BABY DOCTOR. By Isaac B. Abt. New York: Whitlesey House, 1943. 310 pp. Price, $2.50.

MODERN pH AND CHLORINE CONTROL. 6th ed. Baltimore: W. A. Taylor & Company, 1943. 83 pp.

ASSOCIATION NEWS

SECOND WARTIME PUBLIC HEALTH CONFERENCE AND
SEVENTY-THIRD ANNUAL BUSINESS MEETING
AMERICAN PUBLIC HEALTH ASSOCIATION
New York, N. Y., October 3–5, 1944
Headquarters: Hotel Pennsylvania

APPLICANTS FOR MEMBERSHIP

The following individuals have applied for membership in the Association. They have requested affiliation with the sections indicated.

Health Officers Section

John W. Buckley, M.D., Orange Health Unit, Orange, Texas, Asst. Director, Jefferson-Orange County Health Units

Emilio Budnik-B., M.D., 615 N. Wolfe St., Baltimore 5, Md., Asst. General Inspector, Chilean Public Health Service

Jose Cobian-Alvarez, M.D., Ysabela 5, Guayanilla, Mayaguez, Puerto Rico, Health Officer

Capt. Angelo A. DiDonna, M.C., 34 Jay St., Schenectady, N. Y., Chief, Venereal Disease Section, Station Hospital, Camp Rucker, Ala.

Manuel A. Frias, M.D., Bruno St., Guayama, Guayama, Puerto Rico, Health Officer

A. M. Garcia-Ubarri, M.D., Alianza 6, Santurce, Puerto Rico, Health Officer

Hector M. Gonzalez, M.D., St. A. Lopez, Humacao, Puerto Rico, Medical Officer

Barbara Hunt, M.D., Lauderdale County Health Dept., Meridian, Miss., Asst. Director

Rafael U. Lange, M.D., Barcelona, Mayaguez, Puerto Rico, Health Officer

Angel M. Marchand, M.D., Monterrey Apt. 1A, Terraza Parque, Santurce, Puerto Rico, Chief, Bureau of Tuberculosis, Health Dept.

J. W. O'Neill, M.D., 351 Cherry St., Fremont, Mich., Director, District Health Dept.

George P. Rapp, York Rd. and Horace Ave., Abington, Pa., Health Officer

Homer D. Rose, M.D., Wentzel Bldg., Sonora, Calif., County Health Officer

Nicolas Sanabria-Fernandez, M.D., 22 Esperanza St., San German, Puerto Rico, Medical Officer, Public Health Unit

Jose M. Santiago, M.D., Betancesst, Vega Baja, Puerto Rico, Health Officer, Insular Dept. of Health

Francisco Sein, M.D., Vilella 12, Lares, Puerto Rico, Chief, Public Health Unit

Armando Silva-Navarro, M.D., Camuy, Aguadilla, Puerto Rico, Medical Inspector, Dept. of Health

Beatrice E. Steiner, M.D., 35 Ft. Washington Ave., New York 32, N. Y., Health Officer-in-Training, Dept. of Health

Gertrud Weiss, M.D., 175 Pinehurst Ave., New York 33, N. Y., Health Officer-in-Training, Dept. of Health

S. G. Zando, M.D., Cinderella Bldg., Williamson, W. Va., Mingo County Health Officer

Laboratory Section

Ruby J. Atkins, 1204 Primrose Terrace, Selma, Ala., Senior Bacteriologist, State Health Dept.

Mary H. Baker, 2627 Clyde Ave., Los Angeles 16, Calif., Public Health Laboratory Technician, Los Angeles County Health Dept.

May E. Barry, 1400 Fell St., San Francisco

17, Calif., Clinical Medical Technologist, Southern Pacific Hospital

Major Abram S. Benenson, M.C., Carlisle Barracks, Pa., Instructor in Military Sanitation

Walter V. Benion, Unit 2, 183rd Station Hospital, APO 942, Seattle, Wash., Laboratory Technician

Melvin F. Burgin, 3041 S. 8th St., Abilene, Tex., Laboratory Director, Abilene-Taylor County Health Unit

Vincent J. DelGiudice, 183rd Station Hospital, APO 942, Seattle, Wash., Laboratory Technician

Lt. Thaddeus J. Domanski, Sn.C., 225 E. 79th St., New York, N. Y.

Robert E. Evans, M.S., 939 Margate Terrace, Chicago 40, Ill., Director, Div. of Laboratories, Evanston Health Dept.

Capt. Hugh F. Fitzpatrick, Sn.C., 141st General Hospital, Memphis 15, Tenn., Chief of Laboratory Service

Manuel M. Guillermety, P. O. Box 3803, Santurce, Puerto Rico, Supt., Guaynabo Filtration Plant

Paul W. Jones, 183rd Station Hospital, APO 942, Seattle, Wash., Laboratory Technician

Capt. Arthur C. Jordan, Sn.C., Station Hospital, Amarillo Air Field, Amarillo, Tex., Asst. Chief, Laboratory Services

Lucile W. Kircher, Greenwich Hospital, Greenwich, Conn., Senior Technician

John W. Martello, 183rd Station Hospital, APO 942, Seattle, Wash., Laboratory Technician

Dr. Alfred N. Metcalfe, P. O. Box 403, Harrisburg, Pa., Chief, Pa. Bureau of Animal Industry Lab.

Miguel Alonzo Molina, M.D., Calle Arce 41, San Salvador, El Salvador, C. A., Chief, Central Laboratory, Rosales Hospital

Constance O. Odden, M.S., 310 Builders Exchange, Duluth, Minn., Bacteriologist-in-charge, State Dept. of Health

Martha G. Papadakis, 1118 Chanslor Ave., Richmond, Calif., City Bacteriologist

Elizabeth E. Pelkus, 113 Steamboat Rd., Great Neck, N. Y., Bacteriologist, Long Island College of Medicine

John L. Perhab, P. O. Box 390, Beverly Hills, Calif., Supt. and Mgr., Water Dept., City of Beverly Hills

Edith Scorup, M.S., 136 State Capitol, Salt Lake City, Utah, Junior Serologist and Bacteriologist, State Board of Health

Kathleen E. Shanahan, 6415 3rd St., N.W., Washington 12, D. C., Serologist, Arlington County Laboratory

Capt. Henry A. Stiff, Jr., Sn.C., Station Hospital, Camp Howze, Tex., Asst. Camp Medical Inspector and Hospital Inspector

Raymond D. Tice, M.D., Cor. 3rd and Juniper Sts., Quakertown, Pa., Chief, Chest Clinic, Quakertown Hospital

Virgil S. Troy, M.S., Continental Can Co., Inc., 4645 W. Grand Ave., Chicago, Ill., Chief, Bacteriological Section, Research Dept.

Helen E. Vance, 2435 S. 5th E., Salt Lake City 5, Utah, Senior Bacteriologist and Serologist, Div. of Labs., State Board of Health

Charles L. Walker, M.A., 183rd Station Hospital, APO 942, Seattle, Wash., Laboratory Technician

Virginia R. Wilson, Station Hospital, Camp Swift, Tex., Bacteriologist

Jean C. Youngberg, 1522 Ensley Ave., Los Angeles 24, Calif., Bacteriologist, Los Angeles County Health Dept.

Vital Statistics Section

A. Joan Klebba, 1200 16th St., N.W., Washington, D. C., Biostatistician, Office of the Coördinator of Inter-American Affairs

Deward E. Waggoner, M.S.P.H., 816 Oregon Bldg., Portland, Ore., Director, Div. of Vital Statistics, State Board of Health

Engineering Section

Jose A. Abdelnoor, Agueduct of Ponce, Puerto Rico, Chemist and Director, Ponce Water Works

Thomas J. Blair, 179 Summers St., Charleston 1, W. Va., General Manager, West Virginia Water Service Co.

Jose del Carmen-Echevers, 1015 E. Catherine St., Ann Arbor, Mich., Asst. Sanitary Engineer, Panama Government

Reinerio Castellon-Flores, Suau St., Santurce, Puerto Rico, Electrical Engineer, Dept. of Health

Isidoro A. Chapa, Jr., Station Hospital, Medical Inspector's Office, Camp Hood, Tex., Senior Sanitary Technician

Howard W. Chapman, 33 Lee Drive, Lake Forest, Wilmington, N. C., P. A. Sanitary Engineer (R), U. S. Public Health Service

Elroy K. Day, 420 Sixth Ave., N., Nashville 3, Tenn., Asst. Sanitary Engineer (R), U. S. Public Health Service

Robert P. Farrell, M.S., 420 Sixth Ave., N., Nashville 3, Tenn., Director, Div. of Sanitary Engineering, State Dept. of Public Health

Nestor Figarella-Orsini, 70 Palmer, Mayaguez, Puerto Rico, Trainee in Public Health, School of Tropical Medicine

Franklin Fiske, M.S.P.H., Hartford Board of Health, 550 Main St., Hartford, Conn., Asst. Sanitarian (R), U. S. Public Health Service

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Patrick L. Hughes, 727 Chiles St., Lakeland, Fla., Senior Sanitarian, Polk County Health Dept.

K. A. Keirn, 171 Second St., San Francisco 5, Calif., Division Manager, Wallace & Tiernan Sales Corp.

Bernard J. Langdon, Box 47, Olathe, Kansas, Asst. Engineering Sanitarian, U. S. Public Health Service

James I. Maston, General Delivery, Richland, Wash., General Sanitarian, Hanford Engineer Works

Rafael Miranda-Franco, 8 Colon St., Stop 43½, P. O. Box 7048, Santurce 29, Puerto Rico, Asst. Public Health Engineer, U. S. Public Health Service

Luis D. Palacios, Ponce de Leon 177, Santurce, Puerto Rico, Sanitary Engineer and Chief, Bureau of Malaria Control, Health Dept.

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Carlos Raul-Saavedra, Allen 71, San Juan, Puerto Rico, Trainee in Public Health, School of Tropical Medicine

Carlos Rivera-Gonzalez, Villaverde No. 13A-Hos, Santurce, Puerto Rico, Student, School of Tropical Medicine

Henry Rodriguez-Fernandez, 32 Hipodromo St., Santurce, Puerto Rico, Student, School of Tropical Medicine

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Albert H. Stevenson, Hamilton-Glenwood Gardens, Yonkers, N. Y., Asst. Sanitary Engineer, U. S. Public Health Service

Wilfred Taylor, 581 Rosedale Ave., Winnipeg, Man., Canada, Inspector, Div. of Sanitation, City Health Dept.

Manuel A. Torres-Aguiar, Urb. Stadium, Caguas, Puerto Rico, Student, School of Tropical Medicine

Industrial Hygiene Section

Ida B. Banfield, Nellis, W. Va., Nurse

Hazel D. Jamison, R.N., Kopperston, W. Va., Visiting Nurse, Koppers Coal Div.

Lt. Col. Henry N. Parrish, Sn.C., Hdq.A.S.C., Patterson Field, Fairfield, Ohio, Chief, Industrial Hygiene Engineering, A.A.F., Air Service Command

Americo Rodriguez-Nazario, Boulevard Santiago Veve, Mayaguez, Puerto Rico

Food and Nutrition Section

Teresa Anglero-Diaz, San Lorenzo, Puerto Rico

Dorothy DeHart, M.A., Roosevelt Hospital, 428 W. 59th St., New York 19, N. Y., Chief Dietitian

Marion E. French, 605 W. 112th St., New York 25, N. Y., Nutritionist, City Dept. of Health

Mathew Klein, M.S., 18 Shephard Ave., Newark, N. J., Owner, Garden State Dairy Lab.

Mildred Krohn, 703 State Bldg., Los Angeles 12, Calif., District Nutritionist, State Dept. of Public Health

Loucille G. Langham, M.S., 1901 Hopi Trail, Austin, Tex., Nutrition Consultant, State Dept. of Health

Gertrude G. Mudge, A.M., 404 Riverside Drive, New York 25, N. Y., Supervising Nutritionist, Dept. of Health

Ernest S. Tierkel, V.M.D., 328 W. 89th St., New York, N. Y., Veterinarian, Meat Inspection Div., W.F.A.

Walter Wilkins, M.D., 1800 14th St., N., Arlington, Va., Public Health Nutrition Consultant, U. S. Public Health Service

Maternal and Child Health Section

Lily G. Harris, D.O., 461 Bellevue Ave., Oakland, Calif., Director, East Bay Osteopathic Clinic

Keith O. Taylor, 5105 Dover St., Oakland 9, Calif., Administrator, Children's Hospital

Public Health Education Section

Florence M. Albrecht, 1101 Martin Place, Ann Arbor, Mich., Student, Univ. of Michigan

Mary C. Baker, 33 River St., Boston, Mass., Health Education Worker, Div. of Child Hygiene, State Health Dept.

Wilma Becknell, 228 S. Thayer St., Ann Arbor, Mich., Student, Univ. of Michigan

Clarissa E. Boyd, 169 Van Houten St., Paterson 1, N. J., Acting Exec. Sec., Passaic County Tuberculosis and Health Assn.

Emile Chancy, 800 Oxford Rd., Ann Arbor, Mich., Student, Univ. of Michigan

Grace D. Cole, M.A., 36 West Main St., Middletown, N. Y., Exec. Sec., Orange County Health Assn. Inc.

Cecilia C. Conrath, 1101 Martin Place, Ann Arbor, Mich., Trainee in Health Education, Univ. of Michigan

Eva G. S. Craddick, 2126 Bancroft Way, Berkeley, Calif., School Nurse, Richmond City Schools

Nora R. deRamirez, M.A., 91 Parque St., Santurce, Puerto Rico, Medical Social Worker, Santurce Public Health Unit

Jules Gilbert, M.D., D.P.H., Ministry of

Health and Social Welfare, Quebec, P.Q., Canada, Director of Health Education

Benjamin E. Holsendorf, Phar.D., 141 St. Marks Place, St. George, Staten Island, N. Y., Instructor in Rodent Control, City Health Dept.

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Nancy M. Marshall, P. O. Box 468, Mt. Airy, N. C., State Commander, N. C. Div., Women's Field Army, American Society for the Control of Cancer

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Eli Naser Nahas, M.D., St. Agnes Hospital, White Plains, N. Y., Interne

Georgina A. Pastor, M.A., Villamil No. 27, Santurce, Puerto Rico, Medical Social Worker

Charlotte Payne, 350 Madison Ave., New York 17, N. Y., National Adjutant, Women's Field Army, American Society for the Control of Cancer

Vicente Roure, M.D., Cidra, Puerto Rico, Medical Officer

Lloyd W. Schlegel, 609 Josephine, Flint, Mich., Student, Univ. of Michigan

James H. Stone, Dept. of Public Health, Shawnee, Okla., Trainee in Health Education, Shawnee-Pottawatomie County Health Dept.

Ernest P. Von Allmen, 636 Euclid Ave., Berkeley, Calif., Exec. Sec., Alameda County Tuberculosis and Health Assn.

Public Health Nursing Section

Pauline F. Band, M.A., 117 Meigs St., Rochester 7, N. Y., Public Health Instructor, Genesee Hospital

Pauline J. Bateman, Granville County Health Dept., Oxford, N. C., Staff Nurse

Grace F. Borah, R.N., 814 Main St., Mt. Vernon, Ill., Orthopedic Nurse, Univ. of Illinois, Div. of Services for Crippled Children

Leona V. Bowman, R.N., Johns Hopkins Hospital, Baltimore 5, Md., Instructor, Dispensary Visiting Nurse Service

Doris T. deSainz, R.N., Virtud No. 54, Ponce, Puerto Rico, Public Health Nurses Supervisor, Dept. of Health

Leone H. Doepke, R.N., 1010 Ninth St., Merrill, Wis., City Nurse, Merrill Health Dept.

Margaret B. Dolan, R.N., 210 Kenan Hall, Chapel Hill, N. C., Student, Univ. of North Carolina

Mary M. Dunn, 432 S. College, Bloomington, Ind., Administrative Head, District Health Dept., No. 16, State Board of Health

Mildred E. Dunn, R.N., 557 Alden Drive, Rahway, N. J., Supervisor, Nursing Service, Plant Health Dept., Merck & Co.

Edith Evendoll, R.N., 517 Fourth St., Huntington, W. Va., School Nurse, Board of Education

Sarah V. Fahey, 1121–8th St., Huntington, W. Va., Staff Nurse, Metropolitan Life Insurance Co.

Carmen Figueroa-Iantiago, R.N., 19 Martin Corchado St., Ponce, Puerto Rico, Public Health Nurse

Emilia Figueroa-Rowton, Public Health Unit, Aguadilla, Puerto Rico, Supervisor of Public Health Nurses

Minnie Fink, R.N., 4642 Lindell Blvd., St. Louis 8, Mo., Public Health Nurse, U. S. Public Health Service

Lucille D. Fuller, R.N., 115 York St., New Haven 10, Conn., Student, Yale Univ. School of Medicine

Ruth Kiedaisch, R.N., 1020 Garfield St., McMechen, W. Va., School Nurse, Marshall County School Board

Hope A. McCutcheon, R.N., 3364 Ozark, Houston 4, Tex., Field Supervisor of Public Health Nursing, City Health Dept.

Hermina W. Palan, R.N., 1255 Chartiers Ave., McKees Rocks, Pa., Student, Duquesne Univ.

Esperanza Rivera de Jesus, 10 St. No. 8 Capetilla, Rio Piedras, Puerto Rico, Staff Nurse, Public Health Dept.

Monserrate Rosado-Mendez, 66 Martino St., Barrio Obrero, Santurce, Puerto Rico, Public Health Nurses Supervisor, Dept. of Health

Julia C. Thompson, R.N., 1506 Washburn Topeka, Kan., District Public Health Nursing Supervisor, City-County Health Dept.

Epidemiology Section

Arthur C. Curtis, M.D., 2008 Broadway, Little Rock, Ark., Director, Div. of Tuberculosis Control, State Health Dept.

Gustaf A. Hedberg, M.D., Nopeming Sanatorium, Nopeming, Minn., Medical Director and Superintendent

Major E. Ross Jenney, M.C., Room 3 C. 859, The Pentagon, Washington, D. C., Public Health Officer, Military Government, Army of the United States

James H. Steele, D.V.M., M.P.H., U. S. Public Health Service, San Juan, Puerto Rico, Asst. Sanitarian (R)

School Health Section

Marion E. Bigelow, R.N., Orwell, Vt., Staff Nurse, State Health Dept.

Unaffiliated

Catherine R. Allen, R.N., 31 Beresford Ave., Highland Park, Mich., Student, Univ. of Michigan

Franz Goldmann, M.D., 16 Glenbrook Ave, Hamden 14, Conn., Assoc. Clinical Professor of Public Health, Yale School of Medicine

Archibald F. Kowald, 200 E. Wells, Milwaukee 2, Wis., Lieutenant, Sanitary Inspections, Milwaukee Health Dept.

George P. Miley, M.D., 230 N. Broad St., Philadelphia, Pa., Clinical Professor of Pharmacology, Hahnemann Medical College and Hospital

Charles H. Okey, M.S., 192 Kimberly Ave., New Haven, Conn., Student, Dept. of Public Health, Yale Medical School

DECEASED MEMBERS

Ezra G. Carter, Dr.P.H., Logan, Utah. Elected Member 1924, Public Health Education Section

Paul Hansen, Chicago, Ill. Elected Member 1905, Elected Fellow 1922, Charter Fellow, Engineering Section

Olaf Haraldson, M.D., Minot, N. D. Elected Member 1942, Health Officers Section

William M. Randolph, M.D., Charlottesville, Va. Elected Member 1936, Public Health Education Section

William V. Sanford, M.D., (Major M.C.), Ripley, Tenn. Elected Member 1930, Health Officers Section

Armin V. St. George, M.D., New York, N. Y. Elected Member 1934, Laboratory Section

DR. HALVERSON APPOINTED CHAIRMAN OF THE COMMITTEE AN ADMINISTRATIVE PRACTICE

The Executive Board has announced the appointment of Dr. Wilton L. Halverson, State Director of Public Health in California, as Chairman of the Committee on Administrative Practice. He succeeds Dr. Henry F. Vaughan, resigned.

Dr. Halverson is a graduate in medicine from the College of Medical Evangelists in 1929. For some years he has been Professor of Public Health and Preventive Medicine in his alma mater. In 1932 he received a doctorate in public health from Yale University. Dr. Halverson served as District Health Officer in the Los Angeles County Health Department for four years and as Health Officer of Pasadena from 1934 to 1942, when he became Health Officer of Los Angeles County. He was appointed to his present post as State Director of Public Health in 1943 by Governor Warren. Dr. Halverson has served as Vice-President of the American Public Health Association and has been active in the affairs of the Western Branch. He is a Fellow of the Health Officers Section. One of his first official acts as State Director of Public Health was to authorize a survey of the department's organization and activities, which was completed under the auspices of the Committee on Administrative Practice in 1943. Dr. Halverson has recently been appointed a member of the Board of Scientific Directors of the Rockefeller Foundation.

A.P.H.A. MERIT SYSTEM UNIT SERVES SIXTEEN STATES

The Association's Merit System has announced that more than 70 examinations have now been prepared in response to requests from merit system and civil service agencies in 16 states. Questions for public health nursing examinations have been most in demand. Other examinations available include health officers, sanitarians, and laboratory workers in various grades. The public health engineering field will shortly be covered, and examinations for various medical specialists in public health will be undertaken by the staff of the Unit.

EMPLOYMENT SERVICE

The Association Employment Service seeks to bring to the attention of appointing officers the names of qualified public health personnel and to act as a clearinghouse on employment. This is a service of the Association conducted without expense to the employer or employee.

From the registry of persons available, selected announcements are published from time to time. Appointing officers may obtain lists of all registrants on request.

Address all correspondence to the Employment Service, American Public Health Association, 1790 Broadway, New York 19, N. Y.

POSITIONS AVAILABLE

Wanted: A physician trained in tuberculosis to assume administrative control of the Bureau of Tuberculosis in an eastern city of 200,000 population. Salary $4,500–$5,031 plus cost of living adjustment. Address Box B, Employment Service, A.P.H.A.

Sanitarian wanted: Preferably with Bachelor's degree or engineering degree, plus public health experience or training. Must have own car. Applicant with lower qualifications will be offered an opportunity to take a short, free indoctrination course. Salary $1,920 per year with travel allowance of $50 per month, if qualified. Apply Dist. Dept. of Health, No. 6, Central Office, Newberry, Mich., Dr. Franklin.

Wanted: Pediatrician to supervise medical care of children at cerebral palsy center being established by private institution in coöperation with Illinois Division of Services for Crippled Children. Salary commensurate with experience and training. For further information write Lawrence J. Linck, Director, Division of Services for Crippled Children, 1105 So. Sixth St., Springfield, Ill.

The Department of Health, New Jersey, whose industrial health activities have expanded rapidly during the present war, has announced its need for two full-time industrial hygiene physicians for its Industrial Hygiene Service. As one of the leading states in the production of war materials, New Jersey offers unusual opportunities for gaining experience in occupational disease control besides giving the physician a chance to make a valuable contribution to the war effort. The principal duties of the selected physicians will be consultations in regard to the following: control of occupational diseases; industrial toxicological problems; evaluation of adequacy of plant medical services; promotion of measures which will reduce absenteeism from non-occupational causes; and conduct of industrial health education activities. Physicians interested in these positions should write to the Department of Health, Trenton, N. J.

The Milwaukee Health Department is interested in obtaining an instructor in hospital nursing to conduct a student educational program in its communicable disease hospital. Salary offered begins at $125 per month with maintenance, and increases of $5 per month each year until $135 has been reached. To this basic salary there has been added a cost of living bonus of $30.64 per month, making the total beginning salary $155.64 plus maintenance. Apply to Dr. G. F. Burgardt, Deputy Commissioner of Health, Milwaukee, Wis.

Wanted: Public health physicians in Texas. George W. Cox, M.D., State Health Officer, Austin, Tex.

Hawaiian Territorial Board of Health seeks trained engineer to supervise rodent plague control program. Salary range from $331.67 to $398.33 per month subject to retirement deductions plus bonus. Position under Territorial civil service system with classification of P-4. For further details address A.P.H.A. Employment Service.

Wanted: Physical therapist by Crippled Children's Division. Should be graduate of a school of nursing or of college, with a major in physical education or science; have completed a course in physical therapy; should have had experience in physical therapy, preferably with children. Write for application blank to Merit System Council, 416 Henry Building, 309 S.W. 4th Ave., Portland 4, Ore.

Psychiatric case worker desired for mental hygiene clinic, Department of Health, Peoria, Ill.

Senior Sanitarian, Alaska Health Department. Minimum requirements 2 years college, 6 months public health course, 2 years' experience. Two additional years' experience acceptable instead of each year college. Monthly salary $235–

$265. Mary B. Pool, Alaska Merit System, Juneau.

Michigan announces civil service positions now open for orthopedic public health nurse, Grades II and III classes with the Michigan Crippled Children's Commission. Salary range: Grade II $230 to $270 per month; Grade III $280 to $340 per month. Grade II not under 23, Grade III not under 25. Must have completed course in orthopedic nursing or physical therapy in approved school. For Grade III position a full-time course of at least 9 months' duration is required. Must have 3 years' experience in public health nursing, one year of which shall have been in supervisory capacity. For Grade III position one additional year of nursing and one additional year of supervisory experience required. Eligibility for certificate in public health nursing and registration as a nurse in Michigan. For further information write Michigan Civil Service Commission, 310 No. Grand Ave., Lansing 4, Mich.

Wanted: Sanitary engineer or chemist to assist in stream pollution survey and later in study of sewage treatment. Should be qualified to perform chemical and bacteriological analyses of water and sewage and chemical analyses of industrial wastes. Nine months employment with possibility of indefinite continuation, particularly if person is willing to do some other types of analytical work, including coal analysis. Salary $175–$250 per month depending on qualifications. Women considered. Address communications to Prof. Gilbert H. Dunstan, Dept. of Sanitary and Public Health Engineering, University of Alabama, Box 1996, University, Ala.

Industrial Hygiene Toxicologist. Calls for person of chemical or chemical engineering background. Position, supervising of chemical work of industrial hygiene service and industrial hygiene laboratory; designing special apparatus for field studies on occupational disease problems; conducting field and laboratory analyses of toxicological exposures in industry; keeping records, interpreting results and preparing records. Requirements, knowledge of chemical laboratory methods and equipment; procedures for qualitative and quantitative analysis of organic and inorganic chemistry; knowledge of chemical methods of determining toxic materials in industry; familiarity with petrographic methods of mineralogical analysis. Immediate temporary appointment will be made, to be followed later by civil service examination to determine permanent status. Salary $2,900 base, plus $100 a year war adjustment, or total of $3,000 per year. Travel expenses also allowed. Must be U. S. citizen. Resident of any state may apply. Write J. Lynn Mahaffey, M.D., Director of Health, State Department of Health, Trenton 7, N. J.

Wanted: Public Health Nurse. Salary $175 per month and full maintenance, plus $25 per month for car expense. Must furnish own car. Write Paul D. Crimm, M.D., Director Boehne Tuberculosis Hospital, Evansville 12, Ind.

City of 70,000, southeastern U. S., seeks qualified health commissioner between the ages of 30 and 45, draft exempt. Salary $4,500 plus auto allowance of $300 per year. Box V, Employment Service, A.P.H.A.

Assistant Sanitarian in well established Ohio department of health. Minimum experience 2 years required. Merit system prevails. Salary $1,800–$2,400. Write Box K, Employment Service, A.P.H.A.

Wanted: Bacteriologist to conduct virus laboratory in the Laboratory Section of the Health Division, City of St. Louis. Applicant must have graduate degree with research and practical experience in virology. Salary range from $220 to $360 a month, depending upon ability. Position under Civil Service. Write Box W, Employment Service, A.P.H.A.

Wanted: Statistical clerk, preferably with college degree and experience in health education, to study and analyze vital statistics in suburban and rural county adjacent to Washington. Special emphasis on relation to health department services and participation in Health Honor Roll. Address V. L. Ellicott, M.D., Dr.P.H., Montgomery Co., Rockville, Md.

Wanted: Medical Social Worker for Dept. of Health, Peoria, Ill. Address Director Maternal and Child Health, Dept. of Health, Peoria, Ill.

Wanted: Physician in eastern city of 200,000 population as Director of Bureau of Maternal and Child Hygiene. Salary $4,500–$5,031, plus cost of living adjustment. Address Box C, Employment Service, A.P.H.A.

Wanted: Physician (male), American citizen, draft exempt, trained in pediatrics, for a 3 year position as chief resident and research assistant in fine pediatric tuberculosis hospital, New York. Good salary and maintenance. Only one intensely interested in research need apply. Send full details of qualifications and photo-

graph. Box R, Employment Service, A.P.H.A.

Wanted: X-ray technician to travel with portable x-ray unit taking chest x-rays at tuberculosis case finding clinics. Includes both industrial and school surveys. Salary $35 per week plus travel and maintenance when away from headquarters. Address Box M, Employment Service, A.P.H.A.

Wanted: Resident physician for plant in South America. Must have thorough knowledge of malaria, tropical medicine, and vector control. Must be eligible for licensure in British Colony. Address Box H, Employment Service, A.P.H.A.

Physician wanted as Director of Maternal and Child Health in western county health department. Preferably with training in pediatrics and venereology. Some venereal disease control work also. Man preferred but woman considered. Must be in good health. Salary $4,500 per year with car and expenses furnished. Position for duration of war. Address Box S, Employment Service, A.P.H.A.

Tuberculosis Association in large western city seeks a trained and experienced health education director, a director of medical social work, and a public health nurse supervisor. Attractive positions now open in agency with a dynamic program closely related to official groups. Address Box D, Employment Service, A.P.H.A.

U. S. Indian Service seeks physicians for service in the United States and Alaska. Address Office of Indian Affairs, Health Division, Merchandise Mart, Chicago 54, Ill. Application blanks will be furnished upon request.

Wanted: Medical technologists, also bacteriologist for 550 bed approved California hospital. Give full particulars and state salary desired. Address W. O. Brown, M.D., Kern General Hospital, Bakersfield, Calif.

Wanted: Medical technologist, woman, trained in bacteriology of milk and water, diagnostic cultures, routine blood chemistry and tissue work—paraffin and frozen sections. County position under Civil Service located in the East. Salary to be arranged. Write Box L, Employment Service, A.P.H.A.

Wanted: M.D., instructor in preventive medicine and public health, with interest particularly in biostatistics and industrial hygiene. Salary approximately $4,000. Write Box T, Employment Service, A.P.H.A.

Wanted: Competent, thoroughly trained bacteriologist, woman or draft exempt man, to take complete charge of splendidly equipped small industrial laboratory, Connecticut location, country environment, pleasant surroundings, excellent working and living conditions. This is a permanent post-war position. Write full details including minimum salary requirement to start in first letter. All letters including adequate vitae and photo will be promptly acknowledged. Write Box A, Employment Service, A.P.H.A.

St. Louis, Mo., Health Division, Industrial Hygiene Service, seeks two industrial hygienists, either engineers or chemists. Salaries $225 to $250 per month depending on qualifications and experience, plus travel allowances. Address Robert M. Brown, Public Health Engineer, 64 Municipal Courts Bldg., St. Louis 3, Mo.

FOR OTHER POSITIONS AVAILABLE WRITE EMPLOYMENT SERVICE, AMERICAN PUBLIC HEALTH ASSOCIATION, 1790 BROADWAY, NEW YORK 19, N. Y.

In view of the current active demand for trained and experienced persons in public health, it is suggested that prospective employers communicate directly with the Employment Service, American Public Health Association, 1790 Broadway, New York 19, N. Y., for up-to-date lists of applicants.

POSITIONS WANTED

Administrative

Physician, age 37, M.D. Iowa, Dr.P.H. Harvard, specializing in tuberculosis, seeks position as medical director of a sanatorium or a state bureau of tuberculosis. Exempt from military service. A-476

Physician, M.D. University of Arkansas, M.P.H. Harvard, experienced as county health officer. Age 35. Will consider position as county or city health officer or director of a bureau. A-506

Physician, M.D. Yale, with private practice industrial medicine. Age 39 and draft exempt. Seeks opportunity as public health physician. A-505

Woman physician, experienced in pub-

lic health education and school health service administration and supervision, seeks full- or part-time position, preferably southeastern New York State. A-511

HEALTH EDUCATION

Woman with background of health education and public health nursing, experienced as teacher, supervisor, and writer, seeks teaching position of responsibility. H-507

Health educator with Master's degree in public health and some experience. Prefers position in official agency. H-510

LABORATORY

Research bacteriologist. Unusually trained and experienced woman bacteriologist and serologist now occupying responsible position in state laboratory seeks research work of permanent character. L-468

Water chemist, bacteriologist, M.S. degree in Sanitary Chemistry. Age 36, draft exempt. Eight years' experience in state laboratory working on water, milk and sewage. Prefers Midwest or Pacific Northwest location. L-469

ENGINEER

Well qualified public health engineer seeks responsible position in New York metropolitan area. E-480

MISCELLANEOUS

Public Health Nurse. B.S. in nursing, William and Mary College, age 53, seeks position as coördinator of public health nursing, educational director, or director student nurse public health program. Prefers Middle Atlantic States. M-452

NEWS FROM THE FIELD

OCD CHANGES CHIEF MEDICAL OFFICERS

The Office of Civilian Defense in Washington has announced that George Baehr, M.D., Medical Director (R) U.S.P.H.S., retired on March 1 after 2½ years of service as Chief Medical Officer of the OCD. He will be succeeded by W. Palmer Dearing, M.D., U.S.P.H.S., who has been assistant chief medical officer since the establishment of the Medical Division of the OCD.

Dr. Baehr, in 1941, resigned a reserve commission in the Army to accept a commission as Medical Director in the U. S. Public Health Service for assignment to the newly created Office of Civilian Defense to organize its medical division. Under his direction a staff of technical experts was assembled, regional medical and sanitary engineering offices were established, and an emergency medical service was organized in each state and local community throughout the country. An organization for protection against war gases was set up in the coastal states and in the major industrial centers in the interior. A program of protection and mutual aid for water supply systems and sanitation facilities was established in all states.

According to the OCD, the Medical Division has established a nation-wide system of casualty receiving hospitals, 321 potential emergency base hospitals in 20 coastal states, 180 hospital blood and plasma banks, reserve depots of dried and frozen plasma in 400 cities, more than 120 affiliated hospital units, and 80 emergency nursing units. In recognition of Dr. Baehr's services to the hospitals of the country in time of war, the American Hospital Association at its recent annual meeting voted a special citation to Dr. Baehr and elected him to honorary membership.

NEW OFFICERS OF PENNSYLVANIA PUBLIC HEALTH ASSOCIATION

At a meeting on January 25, the Pennsylvania Public Health Association elected the following officers:

Honorary President—A. H. Stewart, M.D., Harrisburg
President—Henry J. Benz, M.D., Pittsburgh
President-Elect—Harriet L. Hartley, M.D., Philadelphia
Vice-President—Richard P. Lienhardt, V.M.D., Wayne
Secretary-Treasurer—C. E. Houston, Washington
Representative to A.P.H.A. Governing Council—W. W. McFarland, M.D., Pittsburgh

U. S. PUBLIC HEALTH SERVICE AID IN THE RELOCATION OF PHYSICIANS AND DENTISTS

The following is an official statement published at the request of the U. S. Public Health Service:

During its last session, Congress passed a deficiency appropriation bill which included an authorization to the U. S. Public Health Service to enter into agreements with and make certain payments to physicians and dentists to relocate in communities needing medical and dental services. On December 23, 1943, this measure became Public Law 216, 78th Congress.

The law is designed to provide relief to those areas which for various reasons have undergone the hardship of inadequate medical and dental care. Many of these communities have lost their doctors and dentists to the armed forces.

The law also provides an opportunity for the physician or dentist who has wanted to set up practice in another community, but has hesitated because of the financial risk of those first months

during which he and the families in the new town are becoming acquainted. Now, with a 3 month allowance assured and with transportation paid for him, he can make that move with less fear of financial loss.

Any municipality, county, or other local subdivision of government may file an application to secure a physician or dentist. Application forms are secured from the state health department. The application is executed by the legally authorized representative of the community (the city manager, mayor, chairman of the county board of supervisors, county judge, etc.). The application is sent, with the community's remittance of $300, made payable to the Treasurer of the United States, to the state health department for approval. When this approval is given, the state health department forwards the community's application and $300 to the U. S. Public Health Service.

Upon the receipt of the community's application and payment of $300, the Public Health Service can enter into an agreement with a physician or dentist who has a permit to practise in the state in which the applicant community is located, who agrees to practise in that community for at least one year, and who is acceptable to the community. The costs of transportation of the physician or dentist, his family and household effects, are paid. In addition, a monthly allowance of $250 a month for 3 months will be paid to the doctor. Of the total cost of transportation and relocation allowance, 75 per cent is contributed by the U. S. Public Health Service; 25 per cent by the community to which the doctor is relocated.

The total relocation cost to the community will be about $300. If the community's obligation should exceed $300, the balance due must be remitted to the U. S. Public Health Service upon the latter's request. If it is less than $300, the excess will be refunded to the community.

After a written agreement between an individual physician or dentist and the U. S. Public Health Service has been concluded, the first monthly relocation allowance to the physician or dentist accrues from the date of the latter's arrival at the new location. The second and third payments are made at the end of the second and third months.

Travel and transportation costs can be paid in either of two ways. The physician or dentist who has a written agreement with the Public Health Service can apply to the latter for Government transportation requests, and Government bills of lading. If this arrangement is carried out, the Government is billed and the physician or dentist does not have to use his own funds to cover this expense. Or, if he prefers, he may pay travel and transportation himself and be reimbursed for actual and necessary expense upon presentation of his claim to the Public Health Service. These claims must be supported by receipts in so far as possible.

The physician or dentist relocating under agreement with the Public Health Service remains a private, self-employed professional individual. His relation to the community is the same as that of any other private doctor except that he must practise in the new location at least one year. The Public Health Service simply assists in getting together the community that needs a physician or dentist with the professional man who has the necessary permit to practise and who agrees to serve that community in his professional capacity.

The purpose of this relocation plan is to mitigate the doctor shortage, which in some places has been created, in others intensified, by military absorption of medical and dental personnel. The success of the plan will depend in large measure upon the response of

the individual doctor, the initiative of the needy community, and, above all, upon the extent to which the wishes of the applicant communities coincide with the preference of the doctors who volunteer to serve under this plan.

HOSPITAL MEN VOLUNTEERS

The U. S. Office of Civilian Defense in coöperation with the American Hospital Association has published a bulletin for hospital administrators with suggestions for solving serious man power shortage problems and the cultivation of hospital men volunteers. This OCD publication 5013 should be used with OCD publication 3632, A Guide for Local Defense Councils for training volunteers for war services. Requests for copies should be addressed to the U. S. Office of Civilian Defense, Washington.

DELAMAR INSTITUTE, NEW YORK, TO EXPAND TROPICAL MEDICINE

Dr. Harry S. Mustard, the Director of the DeLamar Institute of Public Health, Columbia University, New York, recently announced plans to establish a center in tropical medicine involving new building facilities and expanded personnel with additional laboratories and equipment.

With hundreds of thousands of troops in tropical areas who are threatened by infections and epidemics, an acute need has developed for personnel trained in methods for fighting tropical diseases. Dr. Mustard said: "Alliances, treaties, national policies and trade interests are more than ever carrying Government officials, business men, advisers, physicians and technicians into places whose names they could not have pronounced before the war. They go and will continue to go by ships and airplanes to the uttermost corners of the earth."

According to Dr. Mustard, a substantial temporary grant has been received from the Josiah Macy, Jr., Foundation which will be used in the study of tropical medicine under the new program. A further grant has been received from the John and Mary Markle Foundation for research in filariasis, and provisions have been made for increased instruction in tropical medicine for undergraduate medical students.

REORGANIZATION OF U. S. PUBLIC HEALTH SERVICE STAFF

Surgeon General Thomas Parran of the U. S. Public Health Service recently announced the following appointments authorized under legislation affecting the Service:

Assistant Surgeon General Lewis R. Thompson, in charge of the Bureau of State Services
Assistant Surgeon General Rolla E. Dyer, director of the National Institute of Health
Assistant Surgeon General Ralph C. Williams, in charge of the Bureau of Medical Services
Assistant Surgeon General (Dental) William T. Wright, Jr., chief of the Dental Division
Assistant Surgeon General (Sanitary Engineering) John K. Hoskins, chief of the sanitary engineering division
Medical Director Paul M. Stewart, chief, Division of Commissioned Officers
Medical Director Lawrence Kolb, chief, Mental Hygiene Division
Medical Director Joseph W. Mountin, chief, States Relations Division
Medical Director William F. Ossenfort, chief, Hospital Division
Medical Director Gilbert L. Dunnahoo, chief, Foreign Quarantine Division

HERMANN M. BIGGS MEMORIAL LECTURE

The Hermann M. Biggs Memorial Lecture, held annually in Hosack Hall, New York Academy of Medicine, under the auspices of the Committee on Public Health Relations, will be delivered this year on Thursday, April 6, at 8:30 P.M., by Wilbur A. Sawyer, M.D., Director of the International Health Division of the Rockefeller Foundation. The subject of the lecture will be "International Health." This lecture is open to the general public.

NORTH DAKOTA WORKERS ATTEND SCHOOL ADMINISTRATORS INSTITUTE

The North Dakota State Department of Health, Bismarck, has announced that 30 North Dakota school administrators from the University, teachers colleges, junior and senior high schools, as well as 3 members of the staff of the State Department of Public Instruction, attended an Institute in Health Education for school administrators held at the Center for Continuation Study, University of Minnesota, recently. The arrangements for the Institute were under the direction of Ruth E. Grout, Ph.D., of the College of Education and the Department of Preventive Medicine and Public Health of the University of Minnesota.

DR. RECIO APPOINTED CUBAN MINISTER OF HEALTH

President Fulgencio Batista on March 6 announced the appointment of Dr. Alberto Recio Forns, as Minister of Health to replace Dr. Juane Portuondo Domenech, resigned. Dr. Recio for several years has been technical chief of medical services in the Ministry of Health and is well known to his North American colleagues from his attendance at annual meetings of the Association.

PROGRESS IN STUDENT NURSE RECRUITMENT

A coöperative campaign by nurses, hospital administrators, educators and civic leaders to meet the year's quota of 65,000 new student nurses was mapped out at a meeting on February 24 of the recently reorganized Committee on Recruitment of Student Nurses, called by the National Nursing Council for War Service.

Dr. Thomas Parran, Surgeon General, U. S. Public Health Service, in a message read by Lucille Petry, a member of the committee, called for "the largest fall classes in the history of most schools of nursing, if known national war needs are to be met."

Pointing out that the 65,000 quota was an absolute minimum based on the number of students who could be admitted to schools, Miss Petry stated that in order to reach that goal, 23,000 students would have to be enrolled between January 1 and May 30, and another 5,000 in June classes. Summer and fall admissions in 1943, she said, had reached a total of 41,270. The shortages hampering more rapid expansion of schools of nursing, namely, shortage of clinical facilities, of well qualified instructors, and of housing facilities, were not insurmountable, in her opinion, and steps were being taken to overcome them as soon as possible.

More than 1,100 schools of nursing have applied for admission to the U. S. Cadet Nurse Corps program and approximately 1,000 units have already been approved. These are distributed fairly evenly throughout the country. U. S. Cadet Nurses now number 92,000 enrolled in all classes in schools of nursing, about half of these being new enrollees.

CALIFORNIA OFFERS COURSE FOR SANITARIANS

The School of Public Health, University of California, Berkeley, has announced that 25 sanitarians are currently in attendance at the special training course for sanitarians which began on March 3 and will run through the month of May. The course will include public health administration and organization, communicable diseases and their control, general epidemiology and public health statistics, together with sanitary science and sanitary inspection. Arrangements for the course are under the direction of Dr. Walter H. Brown, the Acting Dean. W. S. Mangold is supervising the instruction.

WILLIAM J. ORCHARD HONORED

William J. Orchard, General Manager of Wallace & Tiernan, Inc., was designated as the "Outstanding Citizen for the year 1943" in a citation from the Chamber of Commerce and Civics of the Oranges and Maplewood, New Jersey, presented at the annual dinner of the Chamber on February 15.

This citation supplemented the one given him on December 7, 1943, by the Belleville Manufacturers Association, Inc., of Belleville, N. J., in which city the Wallace & Tiernan plant is located. The Belleville citation, the first one awarded by the Association, was given on the occasion of its twelfth anniversary, and states that Mr. Orchard's "services to management and labor in our communities in World War II have been of paramount importance to the economic, industrial, and civic life of this area."

Mr. Orchard is General Chairman of the Community Manpower Mobilization Committee, a committee of businessmen and industrialists which he formed in order to solve the labor needs of the Newark Area of the War Manpower Commission. It is reported that the results have earned praise from high government officials, that war production in the area has increased, labor turnover has decreased, and thousands of new people have gone to work in war industry.

INDUSTRIAL HYGIENE CONFERENCE

The Second War Conference of industrial physicians, industrial hygienists and industrial nurses will be held in St. Louis, Mo., May 8–14, at the Hotel Jefferson. The participating organizations are: American Association of Industrial Physicians and Surgeons, American Industrial Hygiene Association, National Conference of Governmental Industrial Hygienists, and American Association of Industrial Nurses.

PERSONALS

Central States

FLOYD C. BEELMAN, M.D.,† with the Assistance of HARRY R. ROSS, M.D.,† Topeka, Kan., is directing the work of the Division of Maternal and Child Health of Kansas State Board of Health, pending the appointment of a person to succeed William Fred Mayes, M.D., resigned. Dr. Beelman is Secretary of the State Board.

ALBERT FISHER, M.D., North Judson, Ind., has been appointed Health Officer of Starke County, succeeding DR. WILLIAM J. SOLT, San Pierre.

ESTHER FRENDBERG, Nutritionist for the North Dakota State Department of Health since June 1, 1943, has been appointed Executive Secretary of the State Nutrition Council of the North Dakota Defense Council. Miss Frendberg has been granted a leave of absence to accept this post. She has been a home economics instructor in Mohall and Mandan High Schools in North Dakota since graduating from the North Dakota Agricultural College.

DOUGLAS H. FRYER, M.D., D.P.H.,† formerly Director of the Bay City-County Health Department, has been appointed Field Medical Director and Assistant Director of the Bureau of Local Health Services of the Michigan Department of Health, Lansing.

CLARENCE A. HARTLEY, SR., M.D., has been appointed Health Officer of Evansville and Vanderburgh County, Ind.

WILLIAM H. HEADLEE, PH.D., recently appointed Head of the Division of Tropical Medicine and Parasitology at Indiana University School of Medicine, Indianapolis, Ind., left in March to conduct a study of tropical

* Fellow A.P.H.A.
† Member A.P.H.A.

diseases in Guatemala, Honduras and Costa Rica. Dr. Headlee was chosen for the work by the Association of American Medical Colleges, the study to be financed by the Markle Foundation in coöperation with the Army Medical Corps.

OSCAR S. HELLER, M.D., Greenfield, Ind., has resigned as Health Officer of Hancock County, Ind.

WALLACE D. HUNT, M.D.,† of the Reserve staff, U. S. Public Health Service, has been assigned to the Division of Public Health, Minneapolis, Minn., to assist F. E. HARRINGTON, M.D.,† the Commissioner of Health.

DAVID LITTLEJOHN, M.D.,* Saulte Ste. Marie, Mich., for the past 7 years Director of the Chippewa County Health Department, became Director of the Wayne County Health Department.

LEWIS A. MOORE, M.D., has been appointed Health Officer of Monroe, Wis.

WILLIAM SAMBORSKI † of the Detroit Department of Health has been appointed to conduct a cross-connection survey for the City of Ann Arbor, Mich. This survey is sponsored jointly by the Water Department and the Department of Public Works.

R. M. SORENSEN, M.D.,* who is in charge of the Division of Venereal Disease Control in the Kansas State Board of Health, Topeka, has been appointed acting secretary of the Kansas Public Health Association in the place of FRED MAYES, M.D.,† resigned, who has joined the staff of the U. S. Children's Bureau, Washington.

WILLARD C. SUMNER, M.D., has been appointed Health Officer of Edgerton, Wis.

* Fellow A.P.H.A.
† Member A.P.H.A.

Eastern States

JAMES D. LEWIS, M.D., of Scranton, Pa., has been appointed Health Director of Lackawanna County, succeeding WILLIAM T. DAVIS, M.D.

HENRY E. MELENEY, M.D.,* Hermann M. Biggs professor of preventive medicine, New York University College of Medicine, recently returned from the Caribbean area on a trip during which he lectured in the School of Tropical Medicine at San Juan, Puerto Rico, and addressed the Puerto Rico Medical Association on advances in the treatment of malaria. Returning through Cuba, Dr. Meleney addressed a special meeting of the Cuban Public Health Association, affiliated with the A.P.H.A., and the Cuban Society of Preventive Medicine on Inter-American Cooperation in Medicine and Public Health.

WARD L. OLIVER, M.D., Cobleskill, N. Y., has been appointed Health Director of District No. 3 with headquarters at Point Pleasant, W. Va.

MEYER SOLIS-COHEN, M.D., has been appointed Assistant Director of Public Health of Philadelphia, Pa.

Southern States

SAMUEL L. ANDELMAN, M.D.,† has been appointed in charge of the Johnson County Health Department, Paintsville, Ky., succeeding DR. EDWARD W. KISSELL, resigned.

SOLOMON J. AXELROD, M.D.,† has resigned as Director of the Division of Preventable Diseases of the Chattanooga, Tenn., and Hamilton County Department of Health to accept a commission as passed assistant surgeon in the U. S. Public Health Service.

WILLIAM ROSS CAMERON, M.D.,* Portsmouth, Va., has been appointed Health Officer for Charlotte, N. C.

DEAN A. CLARK, M.D., Surgeon, U. S.

Public Health Service, Washington, has been appointed Chief Medical Officer of the Office of Vocational Rehabilitation, as recently announced. This new office is a part of the Federal Security Administration. Dr. Clark will have charge of the physical rehabilitation section which is authorized under the Barden-La Follette Act to promote medical care for the physically handicapped. Under the act the federal government carries the full cost of rehabilitating war disabled civilians and half the cost of rehabilitation for other civilians.

JAMES M. CORAM, M.D.,† Beckley, W. Va., has resigned as Director of the Raleigh County Health Department to engage in the practice of medicine at Edwight.

SARAH S. DEITRICK, M.D.,* Washington, D. C., who for some years has been Regional Medical Consultant for the Children's Bureau, has been made Assistant Director for Maternal and Child Health in the Division of Health Services of the Children's Bureau. WILLIAM SCHMIDT, M.D.,* has been assigned as Medical Consultant in the Children's Bureau for the New England region, succeeding Dr. Deitrick.

HARRY C. GALEY, M.D., was recently appointed Health Officer of Key West, Fla.

VICTOR P. GENGE, M.D., Director of the Lake County Health Department, Tavares, Fla., has been appointed in charge of the Highlands-Glades Health Unit, succeeding DR. PAUL J. COUGHLIN, Sebring, Fla.

JOHN W. GILMORE, M.D., of Wheeling, W. Va., has been appointed Director of the City-County Health Department in Wheeling to succeed DR. ANDREW J. NICHAUS, resigned.

WILLIAM G. MORGAN, M.D.,† has been appointed Director of the Clark County Health Department, Winchester, Ky.

FRANK M. STEAD,* Associate Professor of Sanitation at the School of Medicine at Galveston, University of Texas, according to *Science*, has resigned to take charge of studies on industrial hygiene for the California State Board of Health at Berkeley. His successor is JOE B. WINTON, formerly associated with the Harris County Health Department.

JAMES H. WELLS, M.D., Pineville, Ky., has resigned as Health Officer of Belle County, Ky.

EDGAR H. WILLARD, M.D., DR.P.H.,† Berkeley Springs, W. Va., has been appointed as part-time Health Officer for Morgan County.

ROBERT D. WRIGHT, M.D.,† former venereal disease consultant attached to the North Carolina State Board of Health, has been assigned as Medical Officer in charge of the new Kanawha Valley Medical Center at South Charleston, W. Va.

MARTIN D. YOUNG, SC.D.,† Senior Parasitologist, National Institute of Health, has been commissioned as Sanitarian (R) in the U. S. Public Health Service. Dr. Young is in charge of the Malaria Research Laboratory of the National Institute of Health located at Columbia, S. C., and also of the newly organized "Imported Malaria Studies" program.

Western States

J. L. JONES, M.D., DR.P.H.,* Director of the Division of Industrial Hygiene in the Utah State Department of Health, Salt Lake City, and formerly State Health Commissioner of Utah, has resigned to become Chief of Medical Services of the Washington State Department of Health, Seattle.

LYNN J. LULL, M.D.,* has been appointed Director of Local Public Health Services in Idaho. He was

* Fellow A.P.H.A.
† Member A.P.H.A.

American Journal of Public Health
and THE NATION'S HEALTH

Volume 34 May, 1944 Number 5

Preparation of Health Education Personnel for the War and Post-war Periods*

The Responsibility of the School of Public Health

HUGH R. LEAVELL, M.D., DR.P.H., F.A.P.H.A.

Director of Health, Louisville and Jefferson County Health Department, Louisville, Ky., and Professor of Public Health, University of Louisville School of Medicine, Louisville, Ky.

THE job of training personnel for work in the health education field "is not by any to be entered into unadvisedly or lightly," in the words of the *Book of Common Prayer*.

Seventy years ago Elisha Harris,[1] the first secretary of the American Public Health Association, recognized the importance of health education in his statement, "The permanent value and success of any methods or system of sanitary government will depend upon the degree in which the people are generally enlightened, concerned, and made responsible, in regard to their sanitary duties." As a laconic former president of the United States reputedly said on the birthday of a septuagenarian, "Seventy years is a long time." However, even after such a long period, in the fairly recent words of Hiscock,[2] "We must not assume that there is a well articulated 'science' of public health education. The pillars—psychological, sociological, and pedagogical—are themselves none too steady."

A suitable training program for this broad and varied field has been mapped out only with great difficulty. As in many other now well established branches of public health and the social sciences, health education in its early developmental period had to be hewn out more or less from solid rock. And this was done by a relatively small group of geniuses with the innate ability and the broad viewpoint which would have insured success in practically any field of endeavor. The time has now been reached where more or less of a mold may be set up, and a degree of mass production may to a

* Presented before the Public Health Education Section of the American Public Health Association at the Seventy-second Annual Meeting in New York, N. Y.. Ocober 14, 1943.

degree replace the relatively slow custom-built method of development.

Five years ago the Subcommittees of the Committee on Professional Education of the A.P.H.A.[3, 4] prepared two blueprints; one for the education of school health educators, and another for adult health educators. A more recent report of the parent committee [5] includes both types of workers in a more or less common mold. This indicates the feeling that, though the application may be different, similar educational backgrounds may serve satisfactorily in both types of work. This later report, in addition to outlining certain professional qualifications desirable for health educators, concludes that a number of personal characteristics are also important. Among such traits are: creative ability, leadership, good personal health, good judgment, pleasing personal appearance, common sense, adaptability, ability to work with people, ability to size up and meet situations, and the ability to present pertinent facts simply and effectively. It is evident that the importance of health education is now fully realized if paragons such as this are to be required to do the job.

Seriously, however, the report of this committee which has done so much to improve standards for public health personnel, gives an excellent picture of the job to be done and the types of training required properly to fit an aspirant for the work. As the committee carefully points out, a major portion of this training must be completed before the future health educator enters a school of public health. The basic cultural and science background, or its practical equivalent, must be acquired in college, leaving only the completion of the educational process for the postgraduate school. Obviously one who decides upon this field at the time of entering college is in a position to get better preparation than would otherwise be the case. A candidate with preparation in psychology, education, economics, sociology, and enough of the basic sciences to acquire a full appreciation of the scientific method makes the job of the public health school relatively simple. With this sort of a beginning it is necessary only to add training in hygiene and public health, public administration, and the special skills required in health education, followed by carefully planned and supervised field experience in some suitable health agency. Probably most of us will agree with the principles outlined in the committee report. From the viewpoint of public health schools certain features of the training program require more complete discussion.

Since the proper college background is so vital, the schools of public health should make suitable contacts with vocational advisers in colleges likely to give preliminary training to future health educators. Such advisers need to become fully acquainted with the health education field and the type of training required so that the subject may be presented to students in the favorable light it merits. Students showing an interest might well be encouraged to get in touch with one or more of the schools of public health fairly early in their college courses so that they may be able to plan their work effectively. There would also be an advantage in giving the person responsible for admission to the public health school an opportunity to size up the candidate so that he can advise whether success in the health education field is likely from the personality standpoint.

Like health departments and most voluntary health agencies, public health schools do not have all the facilities and personnel they would like. This situation has a very bright side, however. It forces the public health school to go out into the surrounding community and into the faculties and laboratories of

other schools of the university with which it is associated for teaching assistance and for learning opportunities. Some public health students in the past have felt the lack of sufficient contacts with agencies actually working in the community. Doubtless no one in the health field has more work with outside agencies than the health educator, and such contacts as can be made during student days will bear rich fruit in later years. Agencies available to the public health school may vary in quality; but there will be some variation in the quality of community agencies everywhere. Medicine progresses through a knowledge of pathology as well as by a study of physiology, and a few pathological agencies thrown in for good measure will make better clinical material. How good would medical students be who had their training from the examination of only normal persons? Unquestionably the intensive period of field work, which will come after the formal training, is of the greatest importance. My argument is for beginning this sort of thing even earlier than during the period of "internship."

Some public health schools have made it an established policy to keep in close touch with their graduates, even to the point of serving as a sort of employment agency for the students, as well as for employers interested in obtaining qualified personnel suited for particular tasks. This policy has many advantages in addition to the obvious one of finding round holes for round pegs and vice versa. If the school keeps in close touch with its alumni, it can discover whether the training it is giving is the sort that proves of greatest help under actual field conditions. It may be that the proof of the pudding will be the indigestion following its ingestion; but even if this be the case, it is better to find out what went wrong and try to discover a remedy. In other words, the teaching of health education should be eminently practical. The ivory tower approach, if used at all, should be restricted to those few selected individuals who may be trained for complex research in health education problems.

If close contact with health education graduates is important for schools of public health, frequent check-up with employing agencies is possibly even more so. The employers are in a position to indicate whether or not they are getting the service desired from the health education workers in their organization. It is entirely possible that the employers do not know precisely what they ought to require. Would it not be possible and desirable for the schools of public health to assume a little more responsibility in helping to show the employing agencies what they really should have in the way of trained health educators, and what results may be expected if such people are employed? In this line of thought, Riggin [6] has suggested, as a health officer, some ways of evaluating health education work. He says, "The quality of such activities can readily be measured by the editorial acceptance of the syndicated press of news releases, by the reader reaction to the departmental publications prepared for popular consumption, by the listener appreciation of departmental broadcasts, and by response to platform presentations." Additional methods of evaluation are available and should become more widely used.

There is another approach which public health schools can use to advance health education ideas among health administrators of the country. During their formal postgraduate training the future administrators may be given a picture of the health education field. It is a fairly widespread opinion that certain public health schools put a great deal more emphasis on health

education than others. This is inevitable, due to variations in faculty backgrounds and interests. While it is desirable for some schools to do an outstanding job in certain fields, as others develop their reputation along different lines, too much specialization is undesirable.

After graduation the various types of public health professional workers are going to have to work together whether they like it or not. And coöperation on the job can begin in no better place than the school of public health. A person who has learned to work with others in related fields is going to be more useful than someone with the most refined training possible who has never learned coöperation, and who cannot see things from other viewpoints than his own.

Suppose an embryo health officer with all his medical background and hospital experience does cringe when he has to sit through seminar sessions in which the budding health educator fresh from college struggles to find expression in medical terminology. Is it not likely that such a future health officer will be more conscious thereafter of the difficulty the public has in understanding Greek and Latin names? And will not the health educator who rubs elbows with the health officer in training have a more complete knowledge of how his mind works; why he needs to think of budgets and appropriating bodies; why his interest in public reaction to some bit of health education or propaganda may be somewhat different from the interest of the health educator? Perhaps of even greater importance in the training process is the advantage to health officers who will work in jurisdictions so small as to be unable to afford specialized health education workers. Such men can get at least an idea of what the health educators are trying to do, and some conception of the methods by which the objectives are supposed to be accomplished. From this contact they may well acquire enough to be of the greatest value to them in their future work.

Public health schools should not allow prospective health educators to lose sight of the importance of private practitioners of medicine and dentistry in any community educational program. To his patients, the opinion of the physician is vitally important. He can either assist in the community program or can do much to discredit it if he has the feeling that it is ill-conceived, or even if he does not understand it. Mary Connolly [7] has said:

> There probably is no better investment of health education funds to be found than that intelligently planned to keep physicians informed. The personnel of the organization is expanded a hundredfold by each physician who recognizes his part in the field—if we are to elicit the interest of physicians, we must keep them informed as to the problems of the community; we must ask their advice in solving these problems.

Riggin [6] has also pointed out the important place which organized medicine plays in the health education program.

> As a means of increasing the usefulness of the specialist in health education perhaps a closer coöperation with the state medical society could be developed. This organization can be one of the most powerful educational influences in a state.

During their postgraduate training health educators can be given some contact with the local and perhaps the state medical society. Even attendance at meetings will give an idea of the problems of organized medicine and some of the attitudes to be found among its members. This is a force with which to reckon, even though the educator might not agree with all of the opinions expressed. It would not be impossible for the school of public health to coöperate with the local medical society in some program of community education, using students to

assist in preparing material for speakers; possibly in working up topics for newspaper articles and radio addresses, and in various other ways. Such a coöperative arrangement would offer difficulties, but might have very useful consequences. Whatever method the school may determine upon as best adapted to give the student the point of view of the private practitioner, the objective is worthy of considerable effort. The medical associations are doing a great deal of valuable work in health education, and this is one field in which there is likely to be little argument about the encroachment of health agencies into the field of private practice.

It is a bit difficult to say why a health officer is called upon to present the point of view of the schools of public health in this training problem. Possibly he may be compared to a baseball catcher who, standing behind the plate on the receiving end and close enough to the batter to observe him minutely, is allowed to signal the pitcher what kind of a ball to throw. Doubtless, it is helpful for the schools to get ideas from the field so that they may know the needs more completely, and therefore be in a better position to adjust their training programs to meet such needs as may be found to exist.

It is evident that the war has an effect on the training of health educators. The work they are to do upon graduation is more needed than ever before. Some details of the educational technic will need revision in accordance with the prevailing psychology of the public. The training period will perhaps require acceleration. Just as in securing candidates for schools of nursing, it is probable that some financial inducements may be needed to lure prospective students from the immediate appeal of high paid defense jobs. But fundamentally the needs are little different from those of peacetime. It is fortunate that thinking is crystallizing so that the master design will not have to be changed radically, and the training process may proceed apace.

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The Preparation of Health Education Personnel for the War and Post-war Periods*

Supervised Field Work

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COLLEGES and universities throughout the country have accelerated and modified their educational programs to meet the ever increasing demands of the war and post-war periods. Health education is one of the fields in which the need for intensified training has been felt and in which many changes are taking place.

Supervised field work is not new to many professions. For years the doctor, the nurse, the sanitarian, and the social worker have had "internships" included in their training. But only recently has need for such training been felt in the field of public health education. Some students [1, 2] who were working on special thesis problems have had an opportunity to serve as "interns," but until this year no school of public health required field training for all health education majors.

In a recently published report on the Educational Qualifications of Health Educators [3] it is stated that "carefully planned and supervised field experience and 'internship' should be regarded as an important element in the training of the health educator and in the development of skill and ability in the field of health education." The same report also mentions the place for graduate training and recommends "that programs of professional study in health education be offered in those institutions which are providing professional education in other fields of public health, and which have available the required instructional facilities. Field training stations are desirable."

Thus field work has been officially recognized as an essential part of the health educator's training, but to date so little has been done along this line that it was felt that a description of an actual program would be worth while.

The field training program for public health educators which I shall describe here is part of a health education program that began in September, 1941, when the U. S. Public Health Service, in coöperation with the North Carolina State Board of Health and the Cumberland County Health Department, inaugurated the first of a series of demonstrations in community health education in extra-cantonment zones.[4] Since that time, similar programs have developed in seven war counties in North Carolina, in one in South Carolina, and

* Presented before the Public Health Education Section of the American Public Health Association at the Seventy-second Annual Meeting in New York, N. Y., October 14, 1943.

in one in Oklahoma, and at the present time plans are under way for beginning them in many other states.

Health education consultants were loaned by the U. S. Public Health Service to the states mentioned to assist with the development of these programs.

These demonstrations created such an interest in community health education that there was an immediate demand for qualified health educators to develop similar programs in other areas. The demand for such personnel so far outnumbered the supply that several states decided to train their own workers. Provision was made for this training through Social Security funds, and qualified educators were recruited and sent to schools of public health for graduate training in public health education.

In addition to the state fellowships offered, the W. K. Kellogg Foundation made available funds to the U. S. Public Health Service in January, 1943, for training twenty health educators.[5] The School of Public Health of the University of North Carolina was selected as the first training center because the counties in which the community health education demonstrations were being carried on were available as field training centers for health educators from this school.

The curriculum for majors in public health education at the University of North Carolina includes three-quarters of academic work and one-quarter of supervised field work or "internship." Formal courses in public health included in this field of study are: public health administration, epidemiology, vital statistics, sanitation, industrial hygiene, nutrition, venereal diseases and their control, tuberculosis control, bacteriology, parasitology, public health education, problems in public health education, school health education, and mental hygiene. In addition to these strictly public health courses other courses required for majors in public health education are: social science, education, and public speaking. Students may also audit any course in the university that they think may be beneficial to them.

In setting up the curriculum for health educators an effort was made to provide a course of study that would give the educator a thorough understanding of the field of public health and at the same time train her to perform the functions of the health educator. (The best statement of these functions was recently set up by the Committee on Professional Education of the American Public Health Association.[3])

Before the students go into the field they are given special preparation for their field training in a three-quarter problems course in health education. In this course the students work in groups and are asked to find solutions to many of the practical problems that they will meet in the field. Perhaps more important than the actual solution of the problems themselves is the fact that members of the group learn to work together and learn the methods and technics that they must later use with community groups.

The field training program for the first twenty-seven health education majors at the University of North Carolina began in June, 1943, when these students attended an "Institute for Tuberculosis Workers" arranged and conducted by the National Tuberculosis Association and the North Carolina State Tuberculosis Association for the secretaries of local tuberculosis organizations in the state. This institute was held at the headquarters of the North Carolina State Board of Health at Raleigh.

Participation in this institute gave the health education students an intimate knowledge of the objectives and operating program of a voluntary

agency on the national, state, and local level. While in Raleigh the students also visited the offices and laboratories of the State Board of Health and were given an opportunity to learn at first hand about the program and activities of the various divisions of this official state health agency.

From Raleigh each student proceeded to the field training center to which she was assigned. These centers are located in Cumberland, New Hanover, Craven, Carteret, Wayne, Lenoir, and Richmond Counties in North Carolina; in Spartanburg County, South Carolina; and in Pottawatomie County, Oklahoma. From one to four students were assigned to each center, the number depending upon the size of the community, the stage of development of the existing health education program, and the opportunity that the community offered for the student to get the greatest amount of experience in community organization.

The counties where the training centers are located are war counties that are faced with all of the problems that have arisen in such areas—concentrated populations, housing shortages, inadequate nutrition, overcrowded and insanitary eating establishments, prostitution, juvenile delinquency, shortage of nursing, medical, and teaching personnel, industrial hazards, and all of the other problems that have been mentioned many times during this meeting.

In the field training center a two weeks' orientation period was planned for the students by the Health Education Consultant on the staff of the local health department. During this time each student was given an opportunity to meet the entire staff of the health department and to observe their activities. Arrangements were also made for students to meet the heads of all of the agencies in the community that made any contribution to the total health program and to discuss with these leaders the objectives and operation of their programs. After this orientation period the student officially assumed the responsibility of a health educator, with a special assignment for the weeks that remained in this phase of her field training program.

Excerpts from student reports illustrate the type of work carried on in the assigned areas. One student gives the following outline:

Orientation—During the first month we spent a greater portion of our time getting oriented to the health department. We read the daily reports of the health educator, the appraisal form for the county health department, and available materials on state and local statistics and activities. We also made many contacts with local people in connection with organization work.

Organization and Committee Activity—The following aspects of the Executive Committee of the Community Health Education Program were developed. The trainees attended two regular committee meetings and one subcommittee meeting.

1. A review of the committee organization.
2. Introduction to committee members.
3. Report of the library committee on selection of books for school and public library. The books cover topics of venereal disease, social hygiene, and juvenile delinquency. Two hundred dollars has been allotted by the school board and health department for the purchase of the books.
4. Announcement of offer to the committee for radio time by the county medical society.
5. Discussion on garbage disposal in the city.
6. Committee discussed plans for organization work to be done by student trainees from the University of North Carolina.
7. Suggestions for radio programs to be presented by the student trainees were discussed.
8. At the second meeting a report of the radio topics was made.
9. A meeting date for the health council being formed was arranged.

Subcommittee Meeting—

1. Made selection of clubs and organizations which would be invited to have a representative on the Health Council.
2. Suggested that trainees open organization work in one of the school areas.

Organization Among the Colored—

1. The trainees were introduced to the com-

mittee of the Community Health and Defense League and heard a review of their organization and the aims and objectives they had set up.

2. The block leaders were appointed and began their first work by collecting money for the recreation drive. With a goal of $100 set, $63.86 was collected and turned in to the Chamber of Commerce and a recreation area was opened in the colored section.

3. Plans were made for a clean-up campaign when the subject of sanitation was selected for study by the executive committee. The campaign opened with an educational week with district meetings, film showings, and discussions by members of the executive committee and health department personnel.

4. The first home nursing class among the colored was started with 22 enrolled. The interest was stimulated through the activities of the executive committee.

5. Continued making contacts during this period and discussing the recreation drive and plans for the campaign with block and district leaders.

Recreation Program—

1. Interviewed the chairman and three other members of the park and auditorium committee of the recreation council. Wrote and presented a broadcast on the program.

2. Toured the parks with the supervisor and made plans for an in-service training program for the park supervisors. The supervisor offered $10 for supplies.

Materials, Publicity, etc.—

1. Prepared notices for colored churches and wrote two news articles on meetings attended.

2. Learned to run a selectro-slide machine and a Bell and Howell machine and reviewed films from the State Department.

State Department Visit—

1. Visited the bureaus of the State Health Department. Checked out films and books from the department. Had conferences with the State Health Officer and with the Director of the Division of County Health Work.

Another student puts into her description what the program meant to her.

Two months in this county—what does it all add up to? Statistically it adds up to 30 meetings of various kinds, 128 pounds of rat poison, a TB exhibit, etc.; but these are the tangible results which are easily totalled in a statistical report.

What of the things that can't be found in columns of figures—things like the worried look on a little colored boy's face when he asks whether he should have a Wassermann every week—things like the feeling you get riding home through miles of big pine trees under millions of stars, after swatting mosquitoes for an hour and showing VD films to 100 darkies, fresh from the potato fields! Somehow, these are the things that make it all amount to something worth while, and not just another job done!

Coming from an industrial city and a rather sophisticated atmosphere, I really didn't think I'd like living and working in a small, rural community—of course I could do it, but I did expect to be a little bored! To my amazement, I found I just loved every minute of it, and had a wonderful time along with it all. True, many of the people are backward and slow to accept new ideas, and, being a Yankee, I wanted to put a firecracker under them, but those who are convinced that a thing is good are so coöperative and really go out of their way to be helpful.

Working in a small health department was a grand experience, for it was easy to see what each person's job was and how it fitted into the whole health program. We were especially fortunate to be in a department that really coöperated, and with a health officer who was progressive and public health minded.

The biggest revelation to me, however, was seeing the real poverty of the South and the crying need for public health work. Many of the groups with which we worked were very appreciative, but I think I got the greatest personal satisfaction from the colored meetings. There is an earnestness and sincerity about them—even the primitive farm group at the river—when they are trying to learn something, that is touching. One couldn't sit there in the old colored church and watch the darkies file in after a long day's work in the fields, in some of the most outlandish outfits, and realize that people had come to learn something, and that it was up to you to give it to them without feeling part of some larger movement—something much bigger than just social service or health education. Guess it was just that feeling of what democracy is really all about—the more fortunate sharing with the less fortunate for the common good.

Somehow, out of it all, I got the feeling that for the first time I was really pulling my own weight in the world and doing something that was worth while that I could look back on with satisfaction in years to come. And I'm not ashamed to admit that I felt really touched when at our last colored church

meeting the minister said "God bless the health officer and the health educators!"

After an 8 weeks' training period in a community, the students were sent to the headquarters of the American Medical Association in Chicago, where they were given a week's orientation course on the health education program of the American Medical Association and on some special types of health education carried on by other agencies. The topics covered in this phase of the field training are as follows:

General Description of Purpose and Activities of American Medical Association
Health Education in Industry
The Radio Industry and Health Education
Health Education by Radio with a Tour of the NBC Studios
Press Relations and Medical News
The Bureau of Investigation and Its Work
Food and Drug Laws
Editing the Health Magazine
Who Gets Hygeia and Why
Dependable Health Advertising
Reprints
Organization in Health Education
Answering Health Questions by Letter
Traveling Exhibits
Scientific Exhibits
Health Meetings and Speakers
Motion Pictures

Because visual aids are important tools for carrying out any health education program and the health educator must know how to prepare, use, and evaluate them, arrangements were made for the students to receive some intensive instruction in exhibit making at the Cleveland Health Museum.

While this phase of the program concluded the summer field training for the health education majors, they will not actually complete their course until they have participated in an orientation course which will be given late in December at the National Institute of Health and the headquarters of the U. S. Public Health Service.

From the results of this supervised field work, those most closely concerned with it believe that field training should give the students: (1) an appreciation and understanding of the contributions which many agencies and organizations can make to the total community welfare and to the total education program; (2) an accurate understanding of the ways in which these groups function and of how they have worked out their relationships to each other; (3) flexibility in thinking about problems to be solved so that when one way does not work others may be tried; (4) an understanding of how to make a program of work that gives time and emphasis to projects in proportion to their real importance; (5) a sense of the importance of timing in a program of community organization; (6) supervised experience in working with people so that special abilities are recognized and weaknesses overcome whenever possible.

From the point of view of the supervisor, field training is important to her because it enables her to find out what the student can actually do on the job and what sort of a person she really is. In other words. Is she sensitive to other people's feelings? Does she see her place in relation to the rest of the staff, to the program in which she is working, to the community, and to the chief?

How well does she stand up under pressure? Is she ingenious in a difficult situation? How well can she apply what she knows about health education? How well can she organize her own personal program of living? Can she get an over-all view of a situation, or does she tend to get lost in details? What are her outstanding personality patterns?

In supervised field training, therefore, both student and supervisor gain these understandings and insight best in a situation where the student has, (1) a real assignment for which she has actual responsibility; (2) a staff position (with a name and title) which gives her

definite status in the community; (3) freedom to think for herself, find and utilize resources, carry out her ideas, and evaluate the results of her efforts; (4) local supervision that helps her to make the best possible use of the training experience and at the same time give the best service of which she is capable to the coöperating community.

It is noteworthy that such field work as has just been described will become a part of the health education curriculum in two other schools of public health beginning this fall. With this increased interest in the training of public health educators it is expected that a much larger well trained health education personnel will soon be available to assist with public health programs for the war and post-war periods.

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Cleveland Health Museum Receives Substantial Endowment

The Cleveland Health Museum, Cleveland, Ohio, has become the recipient of trust funds established by Elisabeth Severance Prentiss in 1939. The Museum shares with several other institutions in the distribution of about eight million dollars, of which 5 per cent is set aside for the Cleveland Health Museum. According to the announcement, this is believed to be the largest sum ever set aside by an individual for purposes of health education. It is expected that the income from these funds will provide in perpetuity about one-third of the present annual expense of the museum, which represents the amount of the former annual contributions of the late Mrs. Prentiss. The Museum has received a gift of the residence occupied by Mrs. Prentiss for a Museum site. Through a provision in the will, the Prentiss Foundation is able to receive contributions of others who may wish to support the Museum. Bruno Gebhard, M.D., is the Director of the Museum.

Preparation of Health Education Personnel for the War and Post-war Periods*

Preparation of the Public School Teacher

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THE preparation of the public school teacher for health education has long been recognized as important. As far back as 1839, Caroline Beecher of Hartford Female Seminary wrote in an essay on The Profession of a Woman:

> What is the profession of a woman? Is it not to form immortal minds, and to watch, to nurse, and to rear the bodily system, so fearfully and wonderfully made, and upon the order and regulation of which, the health and well-being of the mind so greatly depends?—Have you been taught anything of the structure, the nature and the laws of the body, which you inhabit? Were you ever taught to understand the operation of diet, air, exercise and modes of dress upon the human frame? Have the causes which are continually operating to prevent good health, and the modes by which it might be perfected and preserved, ever been made the subject of any instruction?

Two major wars have been fought since Miss Beecher's day, wars in which many lives were needlessly lost through sickness and disease. Today, in the throes of the worst conflict the world has ever seen, we turn to the teacher for his share of help in community-wide efforts to provide the nation with man power physically and mentally capable of carrying on effectively in the armed forces, and in industry, agriculture, and community services. The brunt of the load in the immediate emergency will necessarily fall on teachers at the secondary level whose students are a most important source of wartime man power. It would be shortsighted, however, not to recognize the indispensable rôle the elementary teacher must play in laying the foundations of good health in the on-coming generation. Moreover, it is safe to say that in the present and post-war periods, both elementary and secondary teachers will participate more actively in efforts for general community health improvement, not only as an essential part of their primary task as teachers of children, but also because of the growing recognition of their potential value as lay leaders in health education. Sound preparation is essential if they are to perform these important responsibilities effectively.

In recent years much encouraging progress has been made in the field of teacher education in health. Significant developments have taken place, many under the leadership of members of this group, with the result that the general level of both pre-service and in-service training has been appreciably raised.

* Presented before the Public Health Education Section of the American Public Health Association at the Seventy-second Annual Meeting in New York, N. Y., October 14, 1943.

Despite the progress made throughout the country as a whole, teachers and school administrators remain inadequately prepared for participation in school and community programs. This has been shown clearly in such reports as Dr. Earl E. Kleinschmidt's recent study [1] in which is summarized the status of representative health instruction programs in twenty institutions in various parts of the United States.

In the teaching profession as in public health, the war has intensified many personnel problems. According to data assembled by Dr. Benjamin W. Frazier of the U. S. Office of Education, teacher turnover has doubled since our country entered the war. Many married ex-teachers and older teachers, long out of service, are returning to replace teachers who have entered the armed services or turned to more remunerative jobs in war industry. Contrary to popular opinion, the greatest number of actual vacancies are in junior and senior high school grades. "During the past two years," according to Dr. Frazier, "there has been a decrease of one-third in the enrollments of students in the teachers colleges and normal schools, and almost as large a decrease in the schools of education in the universities." There is, moreover, "a growing lack of interest in teaching on the part of students." [2] These facts force us to approach the whole problem of teacher preparation critically in an effort to seek methods which are applicable under wartime conditions. We need teachers able and willing to do the job now, and we must find ways of giving them the essential preparation. This is particularly true in the secondary field where teachers are least prepared and the health problems are especially acute. Because of the urgency of the secondary problem, this discussion will be limited to an exploration of what seem to be practical and expedient approaches to the health education preparation of secondary school teachers in the present war period.

Preparation of teachers, as of other personnel, should be based on the job to be done. As previously indicated, in wartime the first job of the secondary field is to "make the greatest number of pupils physically (and mentally) fit to carry on as members of the armed forces or as efficient workers." At the same time it should prepare students to be intelligent citizens, ready and capable to work for their own and their community's health improvement. This will require both health guidance of individual students and group instruction.

A Committee on Wartime Health Education for High Schools, appointed by the U. S. Commissioner of Education and composed of representatives from the Army, the Navy, the Public Health Service, the Children's Bureau, the Office of Education, and representatives from the field has attempted to define the job more precisely in a recently published health education manual for high schools.[3] This committee saw the task as student education in regard to correction of impairments, prevention and control of disease, better nutrition, accident prevention and emergency care, daily program planning for effective living, and sound mental attitudes. In addition, it saw it as one of giving students special health preparation for meeting intelligently and sanely the health and safety hazards or problems associated with military, production and community services.

It was the committee's belief that direct health teaching is essential as well as health instruction in connection with other school activities and subject matter fields. Moreover, health education in the school must be identified closely with other phases of the community health program if it is to be effective. This is a job which requires

a leader within the school well qualified in the field of health, and contributions from all members of the school staff, as well as from health departments, medical groups, parents, and others in the community.

Teacher education for health in the secondary school, therefore, means education of (1) teachers or other school personnel who will be capable of taking health education leadership and doing health teaching; (2) administrators who can intelligently shoulder the responsibility of putting a health program into action, and (3) all other school personnel who can make a contribution to the total program, as teachers of physical education, science, home economics, and social studies.

In the present emergency, this education cannot depend entirely on either the longer procedure of preservice training or in-service training through the usual pattern of summer courses and graduate study. Even if it would, the teachers who could benefit most by further study are likely not to seek it unless some stimulation is given or special financial provision is made. Even with such assistance at hand, reports from the field indicate that suitable recipients for aid in advanced study are increasingly hard to find in this war period. The situation, then, it seems to me, indicates that in addition to usual preparation methods, in-service training programs for teachers on the job should be developed more extensively—programs which will reach first of all the key teachers of the school who are the best qualified to prepare for greater leadership and for health teaching responsibilities, and then as many others as possible. It also involves the utilization of every possible channel to arouse interest and support of administrators. Fortunately, there are many teachers and administrators who already have fine preparation and are doing excellent work in health education. It is for the great majority of unprepared teachers that these suggestions are primarily designed.

In the spring of 1943, as a result of demands from the field, a sceond committee was called together by the U. S. Commissioner of Education to study the problem of the health preparation of school personnel, particularly in the secondary field. Membership on this committee was named by leading professional associations in education and health. The following methods of in-service training were proposed and developed in detail by the committee in its report [4]:

1. Staff or group conferences for discussion of health problems of students and community.
2. Study of health conditions or health education programs. Some problems suitable for study are:
 a. Environmental factors
 b. School lunch problems
 c. Evaluation of health education
 d. Curriculum study
 e. Surveys
3. Reading and reference materials
4. Discussion and study groups
5. Local or regional workshops
6. Participation in various health activities, as in the health education activities of the school and community or through observation and field work.

These methods are suggestive only. Their chief merit lies in the fact that they were determined jointly by leaders in education and health and are based on practical procedures which already have proved effective through field experience. In the last analysis, the responsibility for sound teacher education rests in the states and local communities themselves, and it is hoped that no opportunity will be lost during the coming months to exert such responsibility.

The simplest approach to the in-service preparation of teachers is through a planned program in a single school. This program might be initi-

ated in any one of several ways. Perhaps one teacher, or more than one, has shown an interest in health and is seeking further help or a chance to be of greater service. The principal, the nurse working in the school, or some other member of a health staff may discover this interest and give assistance in the form of literature, professional advice, or opportunity for participation under supervision in some school or community health project. Even the busiest administrator or health worker should be able to find time to open up new opportunities for these teachers. Many helpful ideas in this connection are contained in the committee report on teacher preparation to which reference has just been made. This is a natural approach but its potentialities are often missed because it is commonplace and unspectacular. Interest of a few teachers may spread to others and give the principal encouragement to plan for a more extensive in-service training program.

A second, and more organized procedure for a single school would be for the principal to hold staff or group conferences for a discussion of school or community health problems and for the formulation of plans to meet these problems. A point of departure for such discussions, as the committee suggests, might be the ideas contained in the manual *Physical Fitness through Health Education,* or it might be some particularly urgent school or community health need which has aroused the concern of teachers. A third way may be through the formation of a health committee to deal in a more organized manner with special school health problems. This single school approach is especially suitable in an area where a modest start is desirable to demonstrate what can be done in health education, or where there is no full-time health educator to help plan a more comprehensive program.

Regional, county, and city-wide training programs, aided further by state supervision and state or federal support will be needed on an extensive scale if the important wartime health needs of students are to be met. As suggested previously, an attempt might first be made to bring together in natural working units the teachers who have been selected in each school to take leadership in health education. This plan has been tried in a number of places and is being contemplated in at least one large New England city in connection with a community-wide health education program. A few years ago in Cattaraugus County, N. Y., for example, delegated teachers from four experimental high schools met three or four times a year, and during the remainder of the time functioned as separate school committees. The larger group was organized originally to work out plans for the improvement of health education in the county. Among the activities it carried out which were especially educational for the members of the group were: preparation and use of survey forms for the study of pupil, school and community health needs; making and carrying out of plans to improve conditions found by these surveys; consultations as a group with members of the local health department; and study of health services available in the county. Teachers who had had previous preparation and were already well qualified in health education became the natural leaders of their respective school groups.

Appropriate problems for similar groups to consider now are: the part education can play in meeting health needs of students engaged in war work; providing pre-induction health training for young men and women soon to enter military services; and helping solve community health problems accentuated by the war. For example, if such a group found that students are needed

for the care of young children, for assistance in clinics, or for some other community service, the group might work out plans to give students the essential health preparation, and assemble materials needed in such a program. This would require extensive reading, consultation with professional health personnel, or other preparation which could become a worth while educational experience for the teachers.

A slightly different and more organized approach would be to have school health personnel, local health departments, or other community health groups offer their facilities and personnel for short courses to be given during the year in out-of-school hours with perhaps a certificate granted to show satisfactory completion of the work.

Possibilities for more comprehensive study and service programs as through extension, correspondence, and field courses, or in workshops and institutes should be fully explored with nearby teachers colleges and universities, and with state departments of education and health. Experience which others have had with these different training methods should be utilized. It is impossible at this time to describe the many pioneering programs which have been attempted. A brief mention can be given to only a few which seem to have special implications in wartime, namely, the community workshops conducted by the University of Michigan [5] and the University of Kentucky in local communities to serve primarily the local teachers; the short institutes for teachers or administrators held under the sponsorship of such groups as Massachusetts Institute of Technology,[6] New England Health Education Association,[6] Teachers College, Columbia University, and the Center for Continuation Study at the University of Minnesota; the extension and summer courses supported by the state departments of education and health and the universities or teachers colleges in Tennessee, Michigan, North Carolina,[7] and Oregon; and the special institute and field service program in malaria education conducted by the U. S. Public Health Service.

The growing tendency of teacher preparation institutions to serve as centers for the guidance of educational programs in their respective localities has significance in respect to the problem at hand. What is needed now is further experimentation under state and federal leadership in the development of coöperative plans between these institutions and local departments of education and health.

Well qualified teachers who have had the benefits of further preparation may be used for wider service than in their own schools alone. In Cullman County, Ala., for example, a high school science teacher who had received advanced education in health, and had helped in the development of an excellent health program in his own school, was recruited by the county superintendent and county health officer as a part-time health education consultant for the other high schools in the county. In Tennessee, selected teachers who have received scholarships from the State Department of Health for summer study in health education at the university, have returned to their local communities and have made outstanding contributions not only to health improvement within their own schools but in the community at large. Some have been instrumental in securing new health units for their counties. A few have been appointed as full-time health educators in county and city systems.

Little has been said here about the preparation of school administrators for their responsibilities in health education. Concerning the importance of this, Dr. C.-E. A. Winslow has stated, "The inclusion of a comprehension of the significance of the school health program in the preparation of school

administrators is a major need. As long as such comprehension is lacking, the program will inevitably fail to reach its goal." [8] If administrators now in service are given a chance to help in the development and extension of community-wide health education programs during this war period, they will grow, I believe, in their ability to put more effective programs into action.

There is every indication that the need for teacher preparation in health education will not have diminished in the post-war period. New and even more complex problems are likely to develop which may require different training procedures. Experience gained now through the application of the principle of building a teacher education program around the job to be done under existing conditions should prove of value in the future.

Pre-service and in-service education of teachers and administrators may be expected to expand rapidly in the post-war period. Teachers colleges and universities, in coöperation with local school systems and health departments, should begin now to plan for more dynamic institutional and field programs for the health preparation of teachers.

Professional community health educators will be in greater demand if the impetus now being given by the U. S. Public Health Service and other groups continues. Well prepared teachers who have shown their ability in school and community leadership may become important recruits as such workers in the future.

Adequate health preparation of the public school teacher will bring rich dividends to the school and community. Public health has a vital part to play in this preparation.

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Multiple Antigens for Active Immunization*

IN response to numerous requests, a Sub-Group on Multiple Antigens has been appointed under the Subcommittee on Evaluation of Administrative Practices, Dr. Haven Emerson, *Chairman*. The report is published herewith at the request of the committee.

Among the possible modifications in specific active immunization procedures which may contribute to administrative economy and efficiency, without loss of benefit to the individual to be protected, is the use of multiple or combined antigens. Military experience and a number of controlled field tests have in the past few years pointed the way to changes in civil health practice which may have merit, for application by the private physician and in the routine protection of child and adult groups in the community under the auspices of local or state health departments.

The Committee on Multiple Antigens was appointed to consider the present state of scientific knowledge and practical experience in this matter and to encourage or undertake such field tests as it might think desirable.

The following report, the result of the committee's deliberations since its organization, is approved by the Subcommittee on Evaluation of Administrative Practices, and by the Committee on Administrative Practice, and is offered as a statement of fact and opinion to serve as a basis of policy for health officers:

1. In the present state of our knowledge, there is no urgent necessity for undertaking, as a wartime measure, an immediate special study of the reactions to the use of combined antigens among children or adults. Added information will become available during routine use of combined antigens. The immunizing effectiveness of such combinations of antigens as are considered desirable for routine use on the basis of practicability, already is supported by a considerable amount of data.

2. The optimal age for initial immunization, the optimal intervals between injections, and the optimal intervals before the renewal of immunization for the different antigens are variable and are important factors in the choice of possible combinations.

3. Combinations which are immunologically feasible should not be selected or recommended unless there exist justifiable reasons for establishing immunity with each antigen represented. Reasons considered justifiable are exposures which are apt to occur in normal civilian life, exposure due to occupation, or exposure due to special social conditions (for example, inmates of an institution).

4. In order to avoid confusion to those immunized, to parents, to clinicians, and to administrative officers, the combinations of antigens made available for use should be uniform in so far as practicable.

5. The influence of combining antigens on the potency of each component must be established prior to their use. Combinations which cause destruction or marked deterioration of an antigen are not considered suitable. The amount of

* Report of the Study Committee on Multiple Antigens, Subcommittee on Evaluation of Administrative Practices, Committee on Administrative Practice, A.P.H.A.

each antigen administered when given in combination must not be less than that required when administered singly.

6. Present experience indicates that non-living antigens combined with alum are better immunizing agents than non-living antigens suspended or dissolved in plain diluents. The proper spacing of the individual immunizing injections is of great importance in developing maximum immunity, as is also the route of the injection.

7. Information is at present sufficiently definite and convincing to justify the statement that immunization against scarlet fever as a routine or community-wide practice under official auspices is inadvisable until a more suitable antigen becomes available.

8. On the basis of the above impressions, the use of pertussis vaccine and diphtheria and tetanus toxoids, either singly or in combination, is considered acceptable prophylactic practice for the immunization of children in normal civilian life, except a pertussis-tetanus combination. There are other antigens, as for example smallpox vaccine, which must always be administered singly. Antigens intended to provide protection against special hazards may be administered singly or in combination, dependent upon the need.

9. Our present knowledge of immunization procedures through active immunization warrants the following recommendations:

a. *Diphtheria*—Administration of the prescribed dosage of plain or alum precipitated toxoid without preliminary Schick test, preferably not later than 6–12 months of age; otherwise as soon thereafter within the preschool age as possible. Repeat or booster dose on school entrance, sooner when indicated. Immunization of younger school children without the use of the Schick test is indicated if toxoid has not been given during preschool life. Immunization of older Schick-positive children or adults when indicated. Special consideration of pseudo-reactors advisable after 9 years of age. Reactions to injections in younger children and persons not pseudo-positive are negligible. Pseudo-reactors should receive immunizing dose divided into several small injections.

b. *Pertussis* — Administration of the prescribed dosage of plain or alum precipitated vaccine at 6–12 months of age. Administration in later preschool ages, or over, less significant as a community practice under official auspices. Value of repeat or booster dose on school entrance not adequately established, though such dose at younger ages advisable. Approved strength of vaccine, 10 to 15 billion organisms per 1 ml., either plain or alum precipitated.

c. *Tetanus*—Administration of plain or alum precipitated tetanus toxoid by itself in the preschool group as a routine practice is not recommended. In combination with diphtheria toxoid, its use is approved in this age group. The administration of tetanus toxoid at any age is recommended, provided the environmental (social or occupational) conditions demand immunity. Experience is as yet not adequate to recommend the time of giving the repeat dose. The indications are that a booster dose in one year with a repeat booster dose at time of injury, provided injury is not more than 5 years after booster dose, will provide adequate immunity so that antitoxin need not be used prophylactically. Reactions to injections at all ages negligible with few exceptions.

d. *Smallpox* — Inoculation before 3 months of age or as soon thereafter

as practicable. Repeat on school entrance and at 5 year intervals as far as practicable. Revaccination upon exposure to active case essential under all circumstances.

e. *Other Antigens of Recognized Value*—Recommended whenever special circumstances demand such immunity.

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State and Provincial Health Authorities Endorse Local Health Unit Plan

At the 59th Annual Meeting of the Conference of State and Provincial Health Authorities of North America held on March 22 in Washington, D. C., under the Presidency of J. Lynn Mahaffey, M.D., State Health Officer of New Jersey, the following resolution was unanimously adopted.

WHEREAS, the outstanding deficiency in public health administration throughout the North American continent is the lack of overall coverage by legally constituted local health organizations, and

WHEREAS, expansion in the field of public health demands that every segment of the population must receive the benefit of full-time public health protection, and

WHEREAS, studies have been made by the Committee on Administrative Practice of the American Public Health Association for the purpose of evolving a plan for complete public health services, and said committee has reached agreements with the state health officers as to the desirable pattern for full-time public health units in 39 states, representing over 85 per cent of the population of the United States, therefore be it

RESOLVED, that the Conference of State and Provincial Health Authorities of North America urge the early implementation of such a program throughout the Continent of North America.

Chemical Warfare—A Chemical and Toxicological Review*

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IN reviewing very briefly the chemistry and toxicology of the war gases, military secrecy demands that my remarks be confined to chemical warfare agents already known to our enemies, and to data about these known agents which will not give them aid or comfort. This, of course, precludes discussion of newer developments, but there is much unrestricted information which may be unfamiliar and of interest.

Of the many thousands of poisonous substances known, only a few have the necessary toxicity, and chemical and physical properties to qualify them as effective war gases.

CLASSIFICATION OF WAR GASES

The chemical and physical properties of the war gases are of primary importance in determining how and when they may be effectively employed, and in predicting what the enemy may do with them. A simple but important classification of gases in this respect refers to the length of time they are effective. If they persist in toxic concentrations at the point of attack less than ten minutes, they are called *non-persistent* gases; if they are effective for a longer time, they are *persistent* gases.

The toxicological properties of the war gases must be known in great detail in order that the proper gas may be selected to produce a particular effect, and in order to know what concentration of the gas must be put down on the target.

The war gases are classified according to their primary toxicological effects, as follows:

WAR GASES

1. Harassing gases
 a. Tear gas (lacrimator)
 b. Vomiting gas (nose gas; sternutator)
2. Casualty gases
 a. Choking gas (lung irritant)
 b. Blister gas (vesicant)
 c. Blood and nerve poisons (systemic poisons)

The harassing gases are used to force the enemy to put on gas masks and to interfere at a crucial time with his effectiveness. These agents have only temporary effects and they do not kill, or even produce dangerous symptoms. The casualty gases are used to injure or kill.

TEAR GASES

The tear gases are all effective in very low concentrations. The most widely employed are the following:

1. Chloroacetophenone, C_6H_5–CO–CH_2Cl, is a white crystalline solid, which is volatilized either from burning or explosive munitions or sprayed as a solution in chloroform, generally mixed with chloropicrin. Once volatilized it is essentially non-persistent. It has a faint odor, somewhat like apple blossoms.

2. Brombenzyl cyanide, C_6H_5–CH–BrCN, is a liquid, which volatilizes slowly. The

* Presented before the Industrial Hygiene Section of the American Public Health Association at the Seventy-second Annual Meeting in New York, N. Y., October 12, 1943.

commercial product is light brown in color. It is used as a liquid spray or in explosive munitions. It is moderately persistent and has a fruity odor.

3. Ethyl iodoacetate, CH_2I-COO-C_2H_5, a brown liquid, is less used. It smells like pear oil.

4. Recently, chloropicrin, C-NO_2-Cl_3, or nitro-chloroform, a pale yellow, volatile liquid, has been reclassified as a tear gas. It also causes vomiting and in high concentration it is an effective lung irritant, making it difficult to classify. It is often used in solution with chloroacetophenone. It is very irritating to the nose and has an odor somewhat like flypaper or anise.

The tear gases (or lacrimators) in low concentrations act almost exclusively upon the eyes to produce pain, blepharospasm, a flow of tears and temporary interference with vision. In high concentrations some also irritate and redden the hot sweaty skin.

VOMITING GASES

The vomiting gases are all crystalline solids and are usually dispersed as fine particulate smokes from burning munitions. They are effective in very small concentrations, but their smokes are non-persistent. They all smell somewhat like burning fireworks.

1. Adamsite, or diphenylamine chloroarsine, $HN=(C_6H_4)_2=AsCl$ produces a canary yellow smoke which fades to colorless as it is diluted by air

2. Diphenylchlorarsine, $(C_6H_5)_2=AsCl$

3. Diphenylcyanarsine, $(C_6H_5)_2=AsCN$, which produce white smokes, which become colorless on dilution with air

The vomiting gases induce at first a strong sensory irritation of the respiratory tract. The symptoms may be delayed a few minutes in their onset, so the victim may get a good dose of the gas before he knows anything is wrong. He then begins rather suddenly to cough, and in the course of a minute or so this becomes quite violent and uncontrollable. He feels as though his trachea was about the size of a balloon and as raw and irritated as a full blown acute tracheitis. He may sneeze some and soon his nose begins to drip a watery secretion. He is quickly salivated, and feels depressed, weak, and ill. If he is severely affected, he will have nausea and vomiting and pain in his teeth and sinuses, particularly the frontal sinuses. These effects, as you may well imagine, make it difficult for the victim to wear a gas mask. A man fully affected by a vomiting gas looks and feels about as miserable as a human specimen can. Fortunately, however, in spite of his alarming symptoms, he is not seriously injured, and it has been demonstrated many times that he is still *capable of strenuous physical exertion.* If he can be induced by inspiring leadership to carry on, he can do so without injury to himself, and the effects pass off in an hour or two.

CHOKING GASES

The most important choking gases are phosgene and chlorine, both gases at ordinary temperatures and pressures, but are generally liquefied under pressure for storage in cylinders, shells or bombs. On opening the cylinders or bursting the explosive munitions, they rapidly evaporate to form a gas cloud, heavier than air. If conditions are right, that is, the ground as cool or cooler than the air and the wind very gentle, these clouds will drift along the ground in effective concentrations for several miles.

Phosgene, $COCl_2$, is a colorless gas which irritates the eyes, nose, and throat. Its odor is difficult to describe, but it is probably nearer like that of very musty hay or crushed green cornsilk than anything else.

Chlorine, Cl_2, is a greenish-yellow gas with a very pungent, irritating odor familiar to all.

The effects of these gases are predominantly upon the lower parts of the respiratory tract, particularly upon the terminal bronchioles. Their immediate action is to induce coughing, due to

sensory irritation, and a feeling of constriction in the chest and shortness of breath, due to bronchoconstriction. The heart is slowed and there begins very early a deficiency of oxygen in the circulation. The victim is usually uncomfortable, restless, and apprehensive. He develops a moderate temperature and may sweat profusely. A fair percentage of cases of poisoning by phosgene, however, recover from their initial symptoms after the first few minutes, and may then experience a feeling of well-being for possibly several hours, provided strenuous exercise and deep breathing are avoided. The bronchospasm, bronchiolar edema, and loosening of bronchiolar epithelium bring on a curious mixture of emphysema and atelectasis of the air sacs and cut down the functional capacity of the lungs. There follows, after a few hours, an outpouring of fluid into the alveoli, which seriously interferes with gaseous exchange and enormously accelerates the developing anoxia. The fluid lost into this lung edema causes a serious progressive hemoconcentration and slowing of the circulation. Some of the subjects during these stages exhibit a dusky cyanosis, peripheral venous congestion, and a rising blood pressure, known as the "blue stage." It is particularly common in chlorine poisoning. The "blue stage" may subside gradually and eventuate in recovery, or it may gradually or suddenly pass into the "grey stage" of circulatory collapse. Many cases of phosgene poisoning fail to go through a "blue stage," but pass directly into the "grey stage" of falling blood pressure and a series of symptoms closely resembling shock. The skin appears pale and waxy and is cold and dry. Breathing is hurried and shallow, and the pulse is weak and rapid. The victim is extremely weak, and fearful of impending death, until unconsciousness supervenes. Death is due to an intense want of oxygen by the body tissues and a widespread interference with metabolic processes, which culminates in circulatory failure.

BLISTER GASES

The blister gases are all liquids which vaporize slowly to highly toxic vapors. There are three main classes of these gases:

1. The sulfur mustards, which are compounds, containing sulfur
2. The nitrogen mustards, which contain nitrogen
3. The arsenical vesicants, which are compounds of arsenic

Either the liquids or the vapors burn and injure any part of the body they contact. The eyes and respiratory tract are particularly susceptible, but the skin as well is reddened, burned, and blistered. When they are ingested in food or water, they violently irritate the gastrointestinal tract and produce all the attendant symptoms of pain, nausea, vomiting, and collapse. They attack any part of the respiratory tract, but the predominant effect is on the upper portion, particularly the pharynx, larynx, trachea, and bronchii. The ciliated cells of the respiratory epithelium are quickly killed and the whole bronchial tree is laid wide open to infection. Secondary bronchopneumonia is very common in the severe cases, and is responsible for most of the deaths. Direct injury may, however, be severe enough to cause death. Respiratory epithelium, exuded serum and leukocytic cells are shed from the surface of the trachea and bronchii as a coagulated, continuous, tenacious cast extending deep into, and plugging, the smaller bronchii and bronchioles. This plugging may so completely block the smaller air passages that the victim is suffocated. The term "cooked" best describes the appearance of the upper respiratory tract. Intense congestion of the lungs with moderate edema completes the terminal picture.

MUSTARD GASES

The only sulfur mustard which has yet been used is mustard gas itself, $S=(C_2H_4Cl)_2$. This was by all odds the king of war gases in World War I. It caused three-quarters of all AEF gas casualties, and three-quarters of the gas deaths.

It is an oily liquid, colorless when pure, but usually brown as employed in the field. Its odor is variously stated to resemble horseradish or garlic, but it stretches the imagination to note the resemblance. Its odor is quite characteristic and resembles nothing else very closely. It can be dispersed in a wide variety of explosive munitions, sprayed from airplanes, sprinkled on the ground from watering carts, or simply dropped from planes in large tin cans. It contaminates everything it touches and in heavy contaminations slowly gives off its poisonous, blistering vapors for days.

The chemistry of the nitrogen mustards is secret. They are all colorless or pale yellow liquids. Some are less persistent and some are more persistent than mustard gas. Their odors vary from fishy to practically odorless. They do not damage the skin as much as mustard gas, but do a first-class job on the eyes and respiratory tract.

Two great tactical assets possessed by the sulfur and nitrogen mustards are their insidious action and persistence. They produce no immediate pain or effects of any kind, and some have almost no odor. The victim may be severely or even fatally injured without knowing he is being exposed.

The degree of injury produced by a casualty gas is dependent upon the product of time and concentration of gas. Since the blister gases vaporize slowly and persist for a long time, they are effective in extremely low concentrations, provided the victim remains in the contaminated area long enough.

In investigating industrial and laboratory accidents due to the mustards, one cannot help being impressed with the fact that the vast majority of the cases had no idea they were contaminated and being burned. Pain and reddening of the skin do not begin for some hours, long after the damage is done. Even liquid mustard in the eye is only mildly irritating for the first hour, yet the damage is irreparably done in the first five minutes.

Some of the nitrogen mustards are quite toxic by skin absorption and readily cause fatalities in animals. The bone marrow, spleen, thymus and lymphoid tissue in general are severely attacked and an almost complete leukopenia develops. This has not yet been observed in man from skin burns.

ARSENICAL VESICANTS

The arsenical vesicants are all organic dichlorarsines, and all are colorless to brown liquids. They all have sharp irritating odors, and lewisite smells strongly like geraniums. They all hydrolyze easily in contact with water or moist surfaces to yield the corresponding arsine oxide.

Lewisite, $Cl—CH=CH—AsCl_2$, or chlorvinyldichlorarsine, has been widely studied, but has not yet had war experience, unless the Japanese employed it against the Chinese. It is more volatile than mustard, and very damaging to the skin and eyes as liquid drops. It has a very low freezing point and can be used in cold weather when mustard would freeze. It can also be mixed with mustard gas to form a low freezing point mixture. It can be dispersed from explosive munitions or sprayed from airplanes.

The other three arsenical vesicants, called Dicks by the Germans and British, methyl Dick, ethyl Dick, and phenyl Dick, have all had limited war service in World War I. Methyldichlorarsine, $CH_3—AsCl_2$, and ethyldichlorarsine, $C_2H_5—AsCl_2$, are fairly volatile,

and are usually dispersed as a vapor from explosive munitions. Phenyldichlorarsine, $C_6H_5—AsCl_2$, is a heavy oily liquid and quite persistent. Like lewisite, it forms an effective low melting point mixture with mustard gas.

In contrast to the insidious action of the mustards, the arsenical vesicants cause instantaneous excruciating pain upon striking the eye, with immediate blepharospasm. Stinging pain is felt by most subjects within 10 to 30 seconds after a liquid arsenical vesicant contacts the skin. Their vapors are likewise very irritating to the eyes and respiratory tract, which compels wearing of the gas mask. Their presence is therefore quickly obvious, and serious injury from them is proportionately less likely, if defensive measures are available.

The arsenical vesicants can cause very deep burns into the muscle and serious or fatal systemic poisoning by absorption through the skin in animals, because the animal is prevented from doing anything about it. No human subject has yet been so seriously burned or poisoned, however, nor does it seem likely to occur unless the victim is unconscious or defenseless.

BLOOD AND NERVE GASES

The third group of casualty agents is known as the blood and nerve poisons (or systemic poisons). Their local effects are minimal, and their poisonous properties are manifest only after absorption into the general circulation. There are a great many possible compounds in this class, and many have been investigated. I shall, however, refer to only two which have a record of war service.

The only one employed to any extent in World War I was arsine gas, AsH_3. It is a colorless, inflammable, diffusible gas. In its highest purity it is odorless, but the commercial item smells strongly like garlic. It can be liquefied in munitions but special precautions are required to prevent it inflaming upon explosion of the shell. It can be generated at the target in wet weather by dispersing a suitable powdered arsenide, which reacts with water to liberate the arsine.

It acts in a number of ways in the body, widely inhibiting enzyme systems, but it manifests itself clinically chiefly by its striking effect upon the red blood cells. In severe cases it causes widespread hemolysis and much of the liberated hemoglobin is passed in the urine. Coagulated debris collects in the kidney tubules, stained almost black by the hemoglobin, and may eventuate in kidney failure, anuria and a uremic death. During the stage of hemolysis, the victim suffers chills, nervousness, exhaustion, and collapse. He soon develops anemia, and in the course of a few hours jaundice begins to appear. This may progress until he is deeply jaundiced. If he survives the hemolytic stage, he may then develop the typical symptoms of arsenic poisoning. As the gas was employed in World War I, however, there were not so many severe cases, and the mortality was very low—only one-half per cent.

Hydrocyanic acid gas was tried abortively in World War I and given up as ineffective. It was then technically difficult to build up crash concentrations of any gas, and this was particularly difficult to accomplish with a light diffusible gas like HCN.

It is a colorless, highly volatile liquid, boiling at 26.5° C. It is dispersed from explosive munitions as a colorless gas having a faint odor of bitter almonds or peach kernels.

Very low concentrations of HCN can be detoxified and eliminated without the development of any symptoms, but high concentrations are more rapidly lethal than those of any other known gas. The rapidity of onset of symptoms is practically identical with the

circulation time from lungs, through the heart, to the brain. The subject becomes confused, befuddled and dizzy in a few seconds. He is seized with an uncontrollable hyperpnea, the depth of respiration being particularly increased. Great weakness and muscular incoördination come on simultaneously and in 10 to 20 seconds the victim is unconscious and beginning to be seized with convulsions. Respiration stops in a half to three-quarters of a minute, except for an occasional gasp, but the heart continues to beat for several minutes. The chances of survival after respiration ceases are small indeed. HCN is almost wholly an " all or none " gas. The subject is either rapidly killed or he quickly recovers. There are, however, a few borderline cases who, as a result of prolonged anoxia of nervous tissue during the poisoning, either die slowly, or recover slowly, and may be left with permanent neurological damage quite analogous to that which sometimes follows carbon monoxide poisoning. The gas acts primarily to inactivate the cytochrome oxidase enzymes. Thus the blood, while itself fully oxygenated, is unable to supply the tissues, because the tissue cytochromes cannot utilize the oxygen. The venous blood is returned to the heart bright red in color and nearly as fully oxygenated as arterial blood. At autopsy these cases have a pink hue to the skin strongly reminding of carbon monoxide poisoning.

There are two other classes of chemical agents, the incendiaries and screening smokes, which may cause incidental injury to troops, but they are not used for that purpose. There are also other gases incident to war, such as carbon monoxide and the nitric oxides, which may cause injuries or fatalities among troops, but they are not employed as war gases.

I should not like this brief discussion of the war gases to give the impression that these agents as employed in war are extremely lethal. On the contrary, the injuries they cause are many times less lethal than those due to other weapons of war. While they caused nearly one-third of all the AEF battle casualties hospitalized in France, they caused less than 10 per cent of the hospital deaths, the mortality being only 1.75 per cent, compared with a mortality of 8.1 per cent due to other weapons.

A very striking comparison is obtained if all those killed in action or dying before reaching hospital are included. The gas warfare mortality is then almost exactly 2 per cent, while that due to other weapons is 24 per cent, a ratio of 1:12.

Large numbers of wounded are a very serious encumbrance to an army. One of the chief tactical values of chemical weapons is their ability to produce large numbers of casualties with relatively few fatalities.

In closing, I should like to stress that there are no super-colossal war gases, of the variety that one drop on a dog's tongue will kill ten men. It takes very definite and large amounts of chemicals to build up casualty producing concentrations in open spaces. This requirement is so great that it seems most unlikely that our enemies could make more than a small nuisance chemical raid against the continental United States. The most likely supposition is that they will consider the benefits to be derived from such a raid not worth the cost and effort.

Tissue Cultures for Virus Investigations in the Field*†

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FLUID tissue cultures have been used for propagation of viruses since 1928 when Maitland and Maitland [1] initiated the use of their preparation. However, the effect on tissue viability in the fluid environment of ratio of tissue to fluid, pH of menstruum, and method of preparation of tissue have been investigated only in recent years.

That there has been a need for detailed studies is seen from the fact that the early preparations were so crude as to suggest complete destruction of tissue. In fact, Maitland and Maitland [2] reported that they were able to grow virus in the presence of non-living cells, a claim that was negated by Rivers, Haagen, and Muckenfuss,[3] who demonstrated living cells in the Maitland cultures.

In previous reports [4] the use of serum ultrafiltrate diluted with Simms physiological solution has been stressed because of the possibility that this protein-free product of ox serum is capable of maintaining viable tissue cells for long periods of time. Furthermore, such a fluid medium is well buffered and is convenient to handle in the laboratory. Maintenance of viability also depends on a low ratio of tissue volume to fluid volume, 1–100 or less, a pH range of 7.2 to 7.6, and the use of a closed culture system (rubber-stoppered flasks). In order to minimize damage to cells during preparation great care should be taken to use sharp instruments for mincing, and the tissues should be washed at least 3 times with decarbonated "Z" solution to remove intracellular autolytic enzymes.

The present communication will attempt to correlate certain information obtained during the course of investigating fluid tissue cultures in regard to virus propagation and to point out possible application of laboratory methods to field studies in virus diseases. Although this study covers a period of more than two years, only summarized or typical data will be presented.

MATERIALS AND METHODS

The various types of *field cultures* as described below consisted of minced chick embryo tissue in 2 ml.* of fluid medium in rubber-stoppered Wassermann tubes. The convenience of working in the field with tubes of this size,

* Presented at a Joint Session of the Epidemiology and Laboratory Sections of the American Public Health Association at the Seventy-second Annual Meeting in New York, N. Y., October 13, 1943.

† This work has been carried out largely under the auspices of the Commission on Neurotropic Virus Diseases, Board for the Investigation and Control of Influenza and Other Infectious Diseases in the Army, Preventive Medicine Division, Office of the Surgeon General, U. S. Army.

* It should be emphasized that larger amounts of fluid medium (and consequently more tissue) may be desirable for certain types of specimens. It is obvious, for example, that sputum can be studied in larger cultures (50 ml.). The amount of medium should vary according to the type of inoculum. In the present study 2 ml. lent itself to manipulation of small amounts of material.

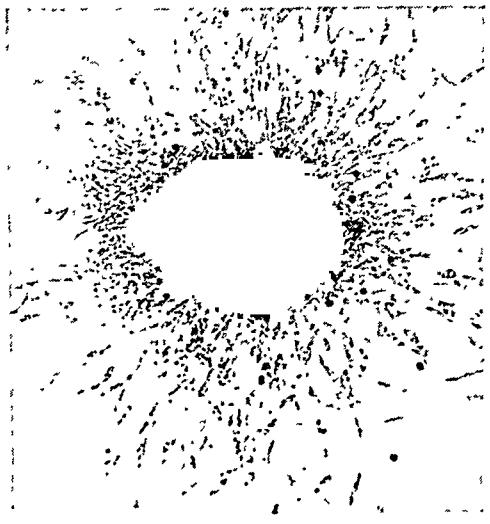
which can be carried in one's vest pocket, is obvious.

At intervals during storage of these cultures, pieces of tissue were removed and plasma-patched in Carrel flasks to test the viability of cells. At the same time, varying amounts of virus were inoculated into the tubes to determine the degree of propagation of virus in cultures of different ages.

Daily observation under the microscope of the presence or absence of proliferating fibroblasts in the Carrel flask subplants made it clear whether or not tissue was viable. Such subplants were used because tissue suspended in a fluid medium will generally not proliferate unless a semipermeable coagulum is present for support of delicate cellular filaments. It may be noted that an embryonic cell may be *alive* without retaining a capacity for proliferation. Conversely, a cell may be in good morphological condition and not be viable. The test of ability to proliferate may be looked upon as a gross and positive sign of cell viability.

Culture Media which were compared consisted of 3 types: serum ultrafiltrate diluted with 2 parts of Simms physiological solution, the physiological solution alone, and diluted serum ultrafiltrate containing a sulfadiazine mixture (9 parts sodium sulfadiazine and 1 part of sulfadiazine). All solutions contained either 2 or 5 mg. per cent phenol red so that the pH could be followed at all times. The pH range was adjusted carefully with 5 per cent CO_2 after the culture was completed and again whenever there was occasion to open the flasks. The formulae for the solutions and more specific details in handling them may be obtained from previous reports.[4]

Tissue—The tissue consisted of whole minced 9 day chick embryo. The eyes and claws were discarded and the tissue was finely minced so that the largest segment did not exceed 2 mm. in diameter. After at least 3 washings with 10 ml. of decarbonated "Z" solution, one drop of tissue was placed in the fluid medium. While it is difficult to state exactly how much tissue was placed in each tube, it should be noted that the tissue suspension is fairly uniform regardless of the amount of washing fluid since the container, usually a Petri dish, is tilted allowing the tissue to settle. The diameter of the pipette is approximately 3 mm. so that one drop of minced tissue is well within the range of the optimal 1–100 fluid to tissue ratio.





FIGURES 1 AND 2—Tissue from Serum Ultrafiltrate after 35 Days at Room Temperature in Tube Cultures (Note luxuriant growth of fibroblasts)

Virus — Equine encephalomyelitis virus (Western strain) was used for these experiments because it has been studied previously in serum ultrafiltrate [5] and because it is representative of a group of viruses which can be grown at will and which are important subjects for field investigations. Although the virus was maintained in mice and in tissue cultures, only the latter was used as source of virus in this investigation.

EFFECT OF PROLONGED INCUBATION AT ROOM TEMPERATURE (25° C. ± 7°) ON THE FIELD CULTURES

As is apparent from Figures 1 and 2, tissues maintained for 35 days at room temperature were viable and capable of proliferation. This finding in respect to the majority of segments in the *field cultures* was repeated and confirmed on many occasions. Although longer periods of time were not tested routinely, there is on record a single instance of viability of tissue after 42 days at room temperature. This fact plus the constancy with which tissue viability could be demonstrated after 35 days, suggests that this interval is not a maximum.

When the physiological solution alone was used without serum ultrafiltrate, tissue viability could be demonstrated only for much shorter periods of time, up to about 14 days (Figures 3 and 4).* For periods up to 1 week it appears to make little difference whether one suspends tissue in physiological solution alone or in serum ultrafiltrate. However, it should also be noted that in serum ultrafiltrate cultures there is little variation in pH from culture to culture and the medium is so well buffered that the shift in pH under various circumstances is minimal.

EFFECT ON THE TISSUE OF VARYING TEMPERATURES

Inasmuch as one may expect in the field a greater variation in temperature than is found in a laboratory situated in the temperate zone (25° C. ± 7°) the above experiments were repeated under more extreme temperature variations. Because serum ultrafiltrate had been demonstrated on the basis of plasma studies to be the superior tissue medium, study of the field cultures at refrigerator temperature (+4° C. to +6°C.) and at 37° C. was carried out

* A photographic record of 21–28 days only is available. From actual observation growth of cells in salt solution alone was sparse, irregular, or absent from 14 days.

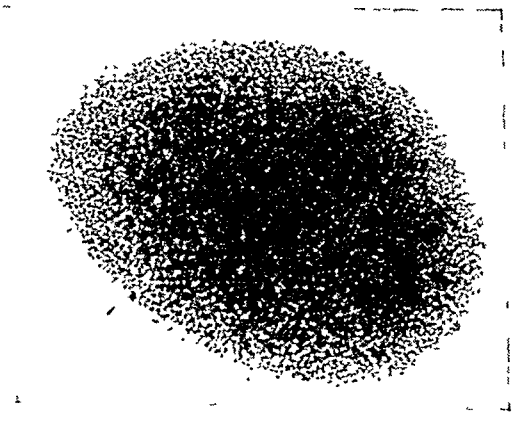


FIGURE 3—Tissue from "x6" Physiological Solution after 28 Days at Room Temperature in Tube Cultures (Note absence of fibroblasts in the vicinity of the Explant)



FIGURE 4—Tissue from "x6" Physiological Solution after 21 Days at Room Temperature in Tube Cultures (Note rare fibroblast)



FIGURE 5—Tissue from Serum Ultrafiltrate after 22 Days at +4° C. in Tube Cultures

with this medium only. In brief, repeated tests showed that at 37° C. tissue remained alive for at least 4 weeks (Figure 6), and at 4°–6° C. tissue viability could be demonstrated for periods as long as 3 weeks (Figure 5). With respect to the latter finding it is interesting to note that cultures in which virus had been propagated at either incubator or room temperature have been placed in the refrigerator for several months with only gradual and relatively slight loss of virus potency. We have made use of this fact for maintaining "auxiliary cultures" which may be used for seeding purposes when contaminations or other accidents damage cultures.



FIGURE 6—Tissue from Serum Ultrafiltrate after 28 Days at 37° C. in Tube Cultures

TABLE 1

Comparative Potencies of Field Cultures of Varying Age (Virus Inoculum: One Drop of 10^{-4} Dilution of Virus-containing Culture Having a Potency of $10^{-4.3}$)

Type of Preparation	*Incubated* *	*Age of Cultures at Time of Inoculation*					
		1 Day	*7 Days*	*14 Days*	*21 Days*	*28 Days*	*35 Days*
Serum ultrafiltrate plus "x6" physiological solution (Simms)	Room temp.	$10^{-5.5}$	$10^{-4.2}$	$10^{-4.8}$	$10^{-4.6}$	$10^{-5.2}$	$10^{-4.8}$
Serum ultrafiltrate plus "x6" physiological solution (Simms)	37° C.	—	—	—	$10^{-5.2}$	$10^{-4.2}$	
Serum ultrafiltrate plus "x6" physiological solution (Simms)	Icebox	—	—	—	$10^{-3.0}$	trace	
"x6" physiological solution (Simms)	Room temp	$10^{-5.0}$	$10^{-5.2}$	0	0	0	0
Serum ultrafiltrate plus 50 mg. per cent sulfadiazine mixture in salt solution (Simms)	Room temp.	$10^{-4.6}$	$10^{-4.5}$	$10^{-4.5}$	$10^{-4.0}$	$10^{-2.8}$	$10^{-2.6}$
Serum ultrafiltrate plus 85 mg. per cent sulfadiazine mixture in salt solution (Simms)	Room temp.	$10^{-4.5}$	$10^{-4.5}$	$10^{-4.5}$	$10^{-3.5}$	$10^{-2.8}$	$10^{-2.5}$
Serum ultrafiltrate plus 100 mg. per cent sulfadiazine mixture in salt solution (Simms)	Room temp.	$10^{-4.8}$	$10^{-2.2}$	0	0	0	0

* Incubation and age of culture refer to culture environment before virus was inoculated. After addition of virus, *all* cultures were placed at 37° C. for 45 hours and were then tested for potency in mice.

CORRELATION BETWEEN TISSUE VIABILITY AND VIRUS GROWTH

As can be seen from Table 1, propagation of virus is closely correlated with tissue viability and even in 35-day-old room temperature cultures LD_{50} of $10^{-4.8}$ was obtained. Since Table 1 is a summary of experiments where the original virus inoculum represented one drop of the final dilution activity of culture used for seeding, it is clear that there was a significant increase of viral potency in the majority of instances where tissue viability had been demonstrated.

ADDITION OF A BACTERIOSTATIC AGENT TO THE FIELD CULTURES

Since the *field cultures* are intended for use in recovering virus from contaminated specimens in the field, the effect of adding a bacteriostatic agent to the fluid medium was investigated. For this purpose a sulfadiazine mixture was used (9 parts of sodium sulfadiazine plus 1 part of sulfadiazine) which was soluble and which did not cause a marked change in pH. Concentrations of 50, 85, and 100 mg. per cent of the sulfadiazine mixture were added to the cultures and studied at various intervals in a fashion similar to that described in the previous sections for the earlier preparations. Examination by the viability test of the tissues which contained the drug revealed that there was some toxic action since, as may be seen from Figure 7, fibroblastic proliferation was not as luxuriant as in those instances when the bacteriostatic agent was absent. Furthermore, the toxicity appeared correlated with the concentration of sulfonamides, the 100 mg. per cent showing no growth after 7 days. On the other hand, with levels of 50 and 85 mg. per cent the sulfadiazine was not so deleterious as to prevent appreciable virus growth even at 35 days at room temperature since minimal inocula of virus in these preparations yielded dilution activities of $10^{-2.6}$ (see Table 1). The 21-day tests were more satisfactory and were active 10^{-4}. In view of the toxic action which the sulfadiazine appeared to exert on the tissues it has become customary to add the drug to the culture at the time of testing unknown specimens. In two series of tests which have been done since the present communication was completed, the *field cultures* have been used for recovery of virus from sputum and from contaminated mosquito suspensions.

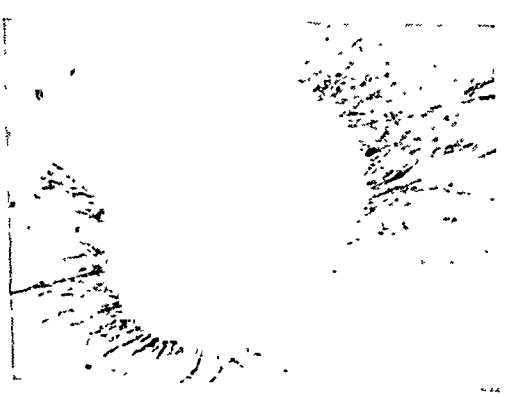


FIGURE 7—Tissue from Serum Ultrafiltrate Containing 85 mg. Per cent Sulfadiazine Compound after 35 Days at Room Temperature in Two Cultures (Compare with Figures 1 and 2)

In the case of sputum * a virus was recovered, but its place among the filterable agents has not been conclusively demonstrated beyond the fact that the agent almost certainly was correlated with the patients' pulmonary infection. However, it is of interest that following centrifugation in the Swedish angle the sputum could be tested in the *field cultures* containing 50 mg. per cent sulfadiazine without bacterial overgrowth taking place to such an extent that animal inoculation could not be carried out.

Preliminary investigations of contami-

* Unpublished data—Sanders, Bullowa, and Alexander.

nated mosquito suspensions * (kindly provided by Dr. W. McD. Hammon) have demonstrated the ability of the *field cultures* to carry contaminated inocula without overgrowth of bacteria. Furthermore, in two other experiments whole untreated mosquitoes have been placed in the bacteriostatic environment of the sulfonamide-containing cultures. Although no virus appeared to be present, it was interesting to note that the heavy contamination present in the whole mosquitoes became progressively lighter by serial passage in the field cultures until bacteria-free cultures were obtained.

How useful the cultures will be for detecting and recovering virus from specimens remains to be seen. Yet in view of previous work there is every reason to expect them to be satisfactory indicators of the presence of viruses capable of proliferating in the presence of embryonic chick tissue. Additional data based on the use of more highly differentiated tissue (e.g., embryonic mouse brain) will be forthcoming in the future.

* Unpublished data—Sanders and Alexander.

CONCLUSIONS

1. Small amounts of embryonic tissue in 2 ml. of serum ultrafiltrate have remained viable at least 35 days at room temperature (25° C. ± 7°) for at least 4 weeks at 37° C. and 3 weeks at 4° to 6° C.

2. Numerous cultures can be made from one chick embryo and no manipulation of the cultures is necessary for the periods designated.

3. The addition of sulfadiazine mixtures have a slightly toxic effect on the tissues, but the drugs may be used as bacteriostatic agents so that contaminated specimens may be tested for virus content.

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Philosophy and Future of Milk Control*

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SANITARY milk regulation has developed slowly, haphazardly, and with little geographical uniformity. It began at points of densest population where adequate supply and distribution were major problems. Its most insistent stimulus has come from recurring epidemics and chronically high death rates among infants and children, supplemented by the economic demand for milk with keeping qualities outlasting the period between production and consumption. Being dependent on public health organization, milk control has necessarily been irregular and inefficient to the degree that local health agencies have lacked purpose and qualified personnel.

Because the future must grow out of the past, it is appropriate in discussing what may hereafter develop in milk control to review briefly the way in which we have arrived at the present stages of regulation and sanitation.

It was just fifty years ago that Nathan Straus began the free distribution of pasteurized milk on the lower east side of New York City, with results confirming his conviction that general pasteurization must become the safeguard of this essential children's food. Minnesota enacted a dairy inspection law in 1895. In 1896 the permit system for milk dealers was initiated by New York City, although its legality was not finally established until 1905 when the Supreme Court ruled in favor of the city department of health; country milk inspection began in 1906; grading was instituted in 1912 when pasteurization was prescribed for Grade B milk. Not until 1926, however, was the sale of raw market milk in New York City completely prohibited and Grade C eliminated. The ultimate objective of a single grade of milk was achieved in 1940 with the adjustment of A and B requirements in both New York State and City to a set of standards applicable to all pasteurized market milk. A further significant step has now been taken by New York City in eliminating the sale of certified raw milk except on physician's prescription. A similar series of events came about in Chicago and they have been and are being duplicated in condensed form in many other urban areas.

A factor which has contributed tremendously to this transition of milk from dangerous irresponsibility to respectability has been the milk ordinance of the U. S. Public Health Service. The ordinance was first offered for general use in 1924, an interpretive code added in 1927, followed by frequent revisions and refinement of its subject matter.

The standard milk ordinance represents a synthesis of the experience and conclusions of the pioneers in milk

* Presented before the Engineering Section of the American Public Health Association at the Seventy-second Annual Meeting in New York, N. Y., October 13, 1943.

sanitation. These pioneers worked in an uncharted field with the untried tools of chemistry, bacteriology, mechanics, and government regulation. When they had demonstrated a large measure of success, their experience became the basis for a comprehensive ordinance and code designed to provide in any virgin area a complete regulatory instrument for milk sanitation.

The Public Health Service was in position to evolve such an instrument with a maximum of detachment from the actual problems of enforcement and the interplay of those forces which, in any given milk shed, profoundly influence the course of milk regulation. The Public Health Service was free to study the theory and practice of pasteurization experimentally and to incorporate all the refinements and to provide for all the conceivable contingencies that could affect the safety of milk.

The standard milk ordinance and its principle of grading were designed for adoption and enforcement in areas where the milk supply had not previously been subjected to effective sanitary control. Emphasis was necessarily placed upon farm inspection and upon those requirements tending to promote safety in raw milk. In actual experience, the goal of complete pasteurization was usually remote, and the immediate problems were to impose uniform regulations and to eliminate, as quickly as possible, inferior dairies and low grade milk. An interesting element of the ordinance has been the advisory relationship which the Public Health Service has attempted to maintain over the areas adopting it. This has involved a system for measuring enforcement and progress under the ordinance and a reporting to the Public Health Service at regular intervals for purposes of publishing compliance ratings.

The widespread use of the Public Health Service milk ordinance is indicated by its adoption by 135 counties and 984 municipalities having a total population of 25,000,000 and located in 37 states and 1 territory (*Public Health Reports,* Vol. 58, p. 320, Feb. 19, 1943, and personal communication, A. W. Fuchs). On the basis of 90 per cent or more compliance with ordinance provisions, about 170 of these are currently listed as satisfactory, although not all of the communities are subjected to the qualifying surveys.

In the past several years, some conflict and controversy have arisen between the proponents of the standard milk ordinance and those who have developed and enforced other bodies of milk regulations. The Public Health Service would achieve uniformity in milk regulation by substituting the standard milk ordinance for all older systems and, in theory at least, bring all milk control areas under the advisory and coördinating influence of the federal agency.

Those who have been closely associated with the older but less definitive regulations have generally opposed their replacement by the standard milk ordinance for several reasons. First, the assumption on the part of the supporters of the standard ordinance that its particular form and completeness of detail somehow assure a higher quality of milk disregards the fact that the personnel and morale of the enforcing agency are the prime factors in achieving results.

Second, the emphasis upon farm inspection in the standard ordinance, while necessary in the early and educational phases of milk regulation, is not as productive of results as is deck inspection with its economy and directness of effort in the older milk sheds. The differences should be recognized between the milk shed subjected to initial regulation and starting with only a small percentage of clean herds, good barns, milk houses, refrigeration, and so forth,

and the milk sheds where several generations of dairymen and milk handlers have become accustomed to regulation and accepted the routine technics and provided, as a matter of course, the physical facilities for clean milk production.

Third, there is a fundamental difference of opinion regarding the degree to which police power should be used by a regulatory agency. Until recent years, it has been generally accepted policy to restrict the use of police power to the attainment of minimum objectives of public safety. Consequently, necessity has largely dictated the content and extent of the older regulations in their slow evolution. On the other hand, the standard milk ordinance is a full-blown instrument which appears to go beyond the level of a reasonable degree of safety in milk. It stresses method and procedure rather than end results and, with respect to the process of pasteurization, sets up requirements of mechanical safeguards for every type of failure or interruption of routine which can be remotely anticipated. Is it desirable to burden both the plant operator and the inspector and to complicate plant equipment with precautionary devices and procedures which rarely, if ever, are required to function? Safety is relative rather than absolute, and a high degree of safety has been achieved by basic pasteurizing equipment and responsible operation. Should not our objective be a minimum rather than a maximum of regulation so long as it achieves the practical objective of eliminating pasteurized milk as a factor in communicable disease?

In the history of milk regulation, the city or local political subdivision has been the chief functioning agency. States have in the past largely ignored what might be considered an acute local problem. It is, therefore, only as the benefits of local sanitary control have been demonstrated that state agencies have been forced to recognize their responsibilities in promoting official supervision wherever milk is commercially handled in quantity. In the absence of such state participation we have that anomalous situation wherein large cities are forced to maintain widespread country milk inspection services which operate to the benefit of satellite communities and lesser cities within the milk shed, without their sharing in the cost or the responsibility. To the extent that the lesser communities do carry on country milk inspection, there is duplication of effort and sometimes conflict and confusion. Yet these communities are not in position to make demands upon or to influence the course of sanitary control by the dominant local health agency.

Country inspection by a city is further unsatisfactory in that it is without police power at the point of inspection and the only punitive measure possible is exclusion of the dairy. Exclusion of a bad dairy frequently results in the sale of its milk in the local area where control may be negligible. Such milk, rejected for pasteurization, is certainly unfit for consumption as raw. The frequency of epidemics involving raw milk in rural areas is not unrelated to this form of inspection which has responsibility only to a limited and distant population.

The answer to this situation is, of course, the assumption by the state of dairy inspection and certification on behalf of all political subdivisions within the state. Only in this way can the quality of milk be improved for small towns and villages now unable to maintain even rudimentary milk control. The tax burden for this service would be equitably spread upon all the population served through a single state agency. This agency should be the state department of health. In a proper relationship between state and local health departments, the latter

could expect and demand efficient and responsible service in the sanitary control of distant milk sources, and the state could in turn require such local farm inspection on behalf of the statewide program as local personnel, resources, and circumstances would permit. Only in this way can local health authorities concentrate their major attention on processing and the condition of milk upon delivery. Only in this way can milk as a commodity be freed from present artificial restraints upon movement, and economics be effected through actual competitive marketing. Further, it is only in this way that milk going directly into dairy products such as butter and cheese can be subjected to the sanitary control it has so generally lacked for these uses.

Objection may be made to this proposal on the grounds that the local unit, vitally concerned with milk quality, would relinquish a responsibility to the state where it might be discharged with less severity and thoroughness. To this, the answer should be that sanitary control of milk will not be efficient or thorough, either on state or local levels, if adequate and technically qualified personnel are not employed. Given a well directed and staffed state organization, systematic and effective dairy inspection becomes a matter of professional responsibility, requiring only financial support and freedom from political interference.

In New York State, a legislative act requires all dairies outside and selling within the state to be inspected and approved by the State Health Department.

While the motive of this legislation was restrictive as to competition, and therefore questionable, it has resulted in a demonstration of the practicability of dairy inspection carried on at the state level and points the way to its logical extension to the sanitary control of all milk supplies used within the state for whatever purpose and from whatever source.

In our contemplation of the future of milk control, we must recognize the fact that large volumes of milk daily move interstate. This movement has been largely within well defined milk sheds and restricted by the inspection limits of some health authority, supplemented in its control, perhaps, by a federal marketing agency. However, the war has suddenly disturbed this situation and caused new concentrations of populations at points remote from adequate milk sources. For example, to meet these changed conditions, milk is now being shipped from New York to Georgia and from Minnesota to Florida for pasteurization and fluid consumption. The disruption of milk sheds has forced a modification of milk regulations, including the formulation of the "Emergency Sanitation Standards for Raw Milk for Pasteurization" for those areas receiving milk from non-standard ordinance jurisdictions.

Prior to this modification in December, 1942, a situation had developed in which the universal adoption of the standard milk ordinance was being urged as in the national interest to make possible the movement of milk to points of increased civilian and military use. At the same time, surveys were being made to determine the acceptability, under standard ordinance provisions, of milk from areas such as the New York City milk shed. These surveys, by the ratings obtained, apparently determined that milk daily consumed in New York City was unsatisfactory and, therefore, by inference, unsafe to be received by a Georgia pasteurizing plant. Such findings were derived chiefly from differences in requirements relating to dairy farm equipment and inspection procedures rather than from any comparison or determination of milk qualities. Because such a position was untenable, certain stand-

ard ordinance areas have since modified their requirements to the extent of adopting the emergency sanitation standards, previously referred to, as applied to milk imported for pasteurization.

There has long been a cry for greater uniformity in milk regulations. Uniformity can be achieved only as all authorities are willing to examine the content of regulations in the light of reasonable objectives of safety and in the broad perspective of interstate traffic in milk unhindered by artificial barriers. The present war has forced a long step in this direction and the future may be revealed somewhat by projecting these trends.

One of the most persistent barriers to uniformity is the unwillingness of one health jurisdiction to recognize enough good in the milk control activities of another to warrant acceptance of its milk. This attitude, combined with the provincial opposition to distant commodities competing with home products, supports the arbitrary restraints now impeding the movement of milk between cities and between states. These restraints admittedly developed when effective milk control was the exception and were necessary to exclude inferior milk from quality markets. But we are coming to a time when milk control in the larger market areas will be found increasingly effective. How then may one community be assured of the antecedents of a surplus or a regular supply of milk from another producing area without maintaining a costly and burdensome inspection service?

The first requirement, to return to a previous thesis, is the state-wide inspection and certification of dairies by a state authority, preferably the state health department. Within the state, certainly, regulations affecting market milk should be uniform, and the inspecting agency should be an acceptable supervisor, coördinator, and clearing-house for milk sources under either local or direct state inspection. The state agency should have both the machinery and the fortitude either to reject the milk from substandard local areas or to supplant local by state inspection until conformity is established.

If this is a rational and desirable arrangement within a state, what of the interstate relationship? States are no more willing than municipalities to accept unverified representations of milk quality. The need, therefore, is for a certifying agency of standing and technical competence to function on a national scale. For this rôle, the U. S. Public Health Service is the obvious choice.

The present system of certification of shellfish has demonstrated the efficacy of such an arrangement. The Public Health Service acts in a supervisory capacity in determining whether the shellfish as produced in a particular state conform to an accepted standard. Such a state reports to the Service those dealers and shippers who conform to such state enforced regulations. The Public Health Service, in turn, transmits such lists to other states and municipalities certifying that they are satisfactory. If the standards or enforcement within a state are unsatisfactory, the Public Health Service may (and does) withhold certification of all its shellfish products. While this system may not prohibit the interstate movement of shellfish from such a state, responsible health departments generally by local regulation prohibit the sale of shellfish not so certified, thus making the system work.

For such a procedure to function for milk, it is necessary that at least some states establish dairy inspection at the state level. The procedures for this purpose must have substantial uniformity as between states and must be acceptable to the Public Health Service.

The achievement of such uniformity and agreement will first require, on the part of the Public Health Service and many state and local health departments, a considerable exercise of statesmanship and a vision of the greater good. Arbitrary attitudes and extremes of perfectionism, conservatism, and local pride will have to be sacrificed to some extent in such a coöperative undertaking. The real objective is, of course, not mere similarity in the wording of milk codes, but substantial conformity to standards of personnel performance, coverage of milk sources, and maintenance of actual milk quality.

At the present time a committee of the International Association of Milk Sanitarians is assigned to make a survey of milk regulations and the extent to which they lack uniformity. Public health and technical organizations concerned with milk sanitation should foster every tendency toward widespread distribution of milk control on a basis of unhindered reciprocity between states and cities so that public health factors will no longer support artificial barriers to the movement of milk to market.

We must recognize that a time is coming when milk will be transported half way across the continent by tank plane, and milk inspectors will hop from dairy farm to receiving station by helicopter. Let us speed the day when milk will no longer be criminally suspect merely because it has been transported from one place to another.

DISCUSSION

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THIS is an excellent paper and an interesting subject for discussion. The central theme is the need for greater uniformity in milk sanitation standards to avoid duplication of inspection and to promote the free flow of milk from one milk shed to another both interstate and intrastate.

Only those who wish to erect a Chinese wall around their milk shed to shut out competitive milk supplies will quarrel with this theme. Members of the industry supplying different markets are confronted with a real problem arising from the multiplicity of milk laws and regulations in effect in different states and even in different cities within the same state. Milk control agencies are burdened with the expense of overlapping inspections. Certainly the public health must be safeguarded, but this can be accomplished by the adoption of uniform standards which would make possible the mutual acceptance by one area of inspection reports made by another.

For many years the Public Health Service has directed its efforts at promoting an adequate and uniform milk sanitation program and organization in each state health department to promote and supervise uniform local control. It has recommended a model milk ordinance for voluntary state and local adoption. This ordinance is now in effect in 135 counties and 984 municipalities ranging in size from under 1,000 to 3,500,000 with a total population of approximately 25,000,000. These areas are located in 37 states and Alaska, i.e., in all except California and the 10 northeastern states. In addition, 14 states have adopted it in whole or in part as state regulations, and 6 more have enacted state laws incorporating its grade definitions. In 1931 the

model ordinance received the approval of the Bureau of Dairy Industry of the U. S. Department of Agriculture. It has been recommended repeatedly for general adoption by the Committee on Milk of the Conference of State and Provincial Health Authorities. In recent years it has been used as a basis for the federal specifications for fresh milk, applicable to all federal departments and agencies, including purchases for the Army and Navy. Its standards are also incorporated in the Interstate Quarantine Regulations to govern milk served on interstate common carriers.

As the Public Health Service milk ordinance is in effect in a far greater number of communities and over an overwhelmingly wider area than any other set of standards, it is logically the one that should be supported by everyone who realizes the need for uniform regulations. The ordinance has passed through the crucible of many revisions suggested by research and experience. There is no reason why it could not be further improved, if necessary, along such lines as may be acceptable both to areas now using it and to those which might use it.

The paper under discussion lists several reasons why certain areas are opposed to the recommended ordinance. Is it not significant that objections to this program come almost entirely from persons who have had no actual experience with it, rather than from those who operate under it and are thus in position to appraise it properly? That is because some of the objections are based on misconceptions regarding its contents and operation. It may therefore be profitable to examine some of the author's statements.

1. It is alleged that the recommended ordinance with its grading provisions is designed for areas without previous effective milk control. This indictment is not in accord with the evidence. Many areas with long experience under other ordinances or regulations also employ a grading system. In 1936, 86 per cent of the municipalities in New England and the Middle Atlantic States which returned our questionnaire reported the use of grades.[1] True, in some cases the grades are designated by such terms as "select," "inspected," "guaranteed," "special," "market," and "family," rather than by letters; but it is grading, nevertheless. Furthermore, many cities with previous milk control experience are now using the Public Health Service program; among the larger ones are Atlanta, Chattanooga, Charlotte, Chicago, Dallas, Fort Worth, Houston, Indianapolis, Jacksonville, Kansas City (Kans.), Kansas City (Mo.), Knoxville, Louisville, Memphis, Miami, Oklahoma City, Portland (Ore.), Richmond, St. Louis, Salt Lake City, San Antonio, Seattle, Tacoma, and Tulsa.

Incidentally, two aspects of the grading provisions of this ordinance are frequently misunderstood and deserve clarification. First, there is the misconception that all of the grades defined in the ordinance are actually sold in all areas operating under it. This is not the case, since section 8 is flexible and leaves to the adopting community the decision as to which grades shall be prohibited. Chicago, for example, permits the sale of only one grade—Grade A pasteurized. Second, there exists the impression that Grade A as defined in this ordinance is a supergrade commanding a high price differential. This may be true in certain areas operating under other regulations, but it is diametrically opposed to the philosophy of the Public Health Service ordinance. Under the latter, Grade A is the normal grade available to everyone at normal prices; the lower grades are usually sold in the larger cities only during periods when a Grade A supply has been temporarily degraded for failure to comply with the Grade A standards.

2. It is alleged that the completeness of detail of the ordinance is a burden both to the plant operator and the inspector, that it is more important to have qualified inspectors, and that our objective should be a minimum rather than a maximum of regulation. This complaint undoubtedly represents a failure to distinguish between the ordinance and the code. Only the ordinance portion is adopted locally, and this occupies less than 17 pages of *Public Health Bulletin 220*—a briefer instrument than many other city milk ordinances and state regulations. The remainder of the 160 page *Bulletin* consists of the explanatory code, which gives the public health reason for each requirement and details of satisfactory compliance. It is the very detailed nature of the code, indeed, that makes it so valuable to those who use it, for it promotes uniform enforcement, avoids unreasonably stringent interpretations on the part of some inspectors and too lenient ones by others, and reduces disagreements with the industry. The code material on pasteurization incorporates the results of many researches and provides reference material to guide the inspector on a highly technical subject. It has resulted in greater uniformity and higher standards for equipment manufacturers. It has served as a textbook in many colleges, and has been widely termed the "Milk Inspector's Bible."

The need for qualified inspectors has long been recognized and supported by the Public Health Service in many ways. That, however, is irrelevant to the immediate question. The same inspector will be better qualified if he has available a definite detailed technical guide than if he relies on unwritten regulations or his own whims. To allege that the detailed explanations in the code are a burden on the plant operator and the inspector is equivalent to saying that newspapers are a burden on the public, or that a textbook is a burden on the student, or that the *American Journal of Public Health* is a burden on our members. On the contrary, far from being a burden, the pasteurization standards of the code have been followed by some of the best plants and by many inspectors outside of Public Health Service ordinance areas.

3. The next allegation made in the paper is that the recommended ordinance places too much emphasis on farm inspection and too little on less expensive deck inspection, that it stresses method and procedure rather than end results. This question merits more detailed consideration than the time limitation will permit.

Farm inspection is necessary not only to insure proper equipment and to detect insanitary technic, but, more important still, to educate the producer in correct methods. A good inspector is primarily a good educator, and the educational approach is more effective in the long run than the policeman attitude. It is reasonable to suppose that the higher the inspection frequency the better the results. One milk inspector observed that bacterial counts rose during a period when he was without an assistant and when the frequency of farm inspection was therefore reduced. However, an inspection frequency above the optimum fails to achieve results commensurate with the cost. Our 1936 questionnaire survey revealed that producing farms throughout the country were officially inspected an average of 7.7 times per year, and that 30 per cent of the municipalities were inspecting them monthly or oftener.[2] The Public Health Service ordinance requires a minimum of 2 inspections per year. By contrast with average practice, this frequency cannot be considered excessive by any stretch of the imagination. Indeed, the ordinance has been criticised for not specifying a greater frequency.

Laboratory and deck examinations are valuable, but they cannot be relied upon as the sole means of judging milk quality. A milk supply with a low bacterial count may be secured from farms with infected cows, insanitary privies, germ-laden flies, improperly sterilized milk utensils, unprotected wells, and even moderately unclean milk handling under low temperature conditions. It may be argued that pasteurization renders such milk safe. But pasteurization is subject to human frailty, slips occasionally occur, heat-stabile enterotoxins may not be completely destroyed, and disease outbreaks from improperly pasteurized milk are reported none too rarely. As long as there are no routine tests capable of detecting all pathogens in milk within the brief period between production and distribution, it is impracticable to determine with certainty the safety of a supply solely by testing the milk. Samples for such tests as are available, including bacterial and phosphatase, cannot be taken with sufficient frequency and in sufficient volume to represent adequately the entire supply. There is as yet no universal agreement among laboratory men on such a fundamental question as the most suitable bacterial tests among the plate count, the direct microscopic count, and the various reduction tests. In addition, our recent surveys of milk laboratories throughout the country indicate that nearly all milk laboratories depart to a greater or less degree from *Standard Methods* and that many of the results are consequently unreliable. Finally, it should be remembered that safety is not the only criterion of quality. Milk must also possess a maximum of palatability if greater and more widespread consumption is to be promoted in the interest of improved nutrition. Palatability is largely the result of clean methods of handling on the farm.

What conclusion can we draw? It seems inescapable that neither inspection alone nor laboratory methods alone can be relied upon for proper control of milk production. The milk sanitarian would be unwise if he refused to utilize all the tools at his disposal. The Public Health Service ordinance stipulates at least 2 farm inspections and 8 bacterial and temperature samples from each producer per year. It is conceivable that this program might be improved by requiring, in addition, a minimum frequency of deck examinations at the receiving platform, provided that deck examinations are proved to be feasible for small plants in small milk sheds. It is hardly likely, however, that a single farm inspection per year would be acceptable during peacetime to areas outside the northeastern states. The argument on costs is not convincing: in 1936 the average expenditure for official local milk control in the 3 southern geographic divisions was approximately 6.2 cents per capita as compared with 6.8 cents in the 2 northeastern divisions,[3] and if industry costs were added the difference would be considerably greater. Perhaps the future will reveal what combination of inspection, sampling, and deck examination frequencies will produce the best results at the least cost.

Having discussed the objections listed in the paper to the Public Health Service milk ordinance, let us now return to the author's main thesis, namely, the need for greater uniformity in milk regulations. To avoid duplication of effort and to promote the free flow of milk, he proposes that the state should assume dairy inspection and certification on behalf of all political subdivisions within the state. Theoretically, state-wide control should be more efficient and more economical than local control. That it has not been generally adopted would indicate a prevailing preference for local control. Adequate state-wide control would re-

quire so large a staff that the program would be in constant jeopardy of being disrupted or crippled through failure of continued appropriations or through constant pressure for the appointment of political inspectors. With local control, on the other hand, these dangers affect individual cities only, not the entire state. This need be no cause for discouragement, however. Experience indicates that state-wide control is not necessary to achieve uniformity, since uniformity has been attained to a considerable extent by the local adoption and enforcement of a uniform ordinance under the supervisory guidance and leadership of a limited state staff. There are now quite a number of states in which practically every municipality has voluntarily adopted the Public Health Service ordinance.

Nor would state-wide control solve the problem of interstate barriers even if all states adopted the same regulations. We need not only uniform standards but also uniform interpretation and enforcement. The Public Health Service recognized long ago that the mere adoption of uniform legislation throughout the country does not of itself assure uniformity of enforcement. For promoting excellent and uniform enforcement the Public Health Service developed a milk shed rating method for the periodic measurement of the control work of municipalities by the state milk control authorities. This is described in *Reprint No. 1970* from the *Public Health Reports*. Many states have been making such ratings for years and submitting them for the purpose of publishing periodically in *Public Health Reports* a list of the communities achieving high ratings. The publication of this list has greatly stimulated good enforcement and has acquainted cities experiencing a milk shortage with areas from which satisfactory supplies can be obtained. Occasional standardization ratings by the Public Health Service reveal whether the rating methods of the shipping state are acceptable. By this system a receiving community is afforded all necessary and legitimate public health protection of its distant sources of supply. It is offered as a means for overcoming existing trade barriers and duplication of inspection.

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Engineering Problems in the Use of Glycol Vapors for Air Sterilization*†

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NONE of the various methods which has been proposed for reducing the incidence of respiratory diseases has ever been found completely effective. Immunizing sera and vaccines have been of great value but the need of further measures is apparent. From the time of Lister's early experiment with phenol sprays, many investigators have attempted to bring about reduction in the bacterial content of air by chemical agents. Until the last few years, however, satisfactory materials to accomplish this have not been available. The ideal substance is one which would be non-toxic, odorless, imperceptible to the occupants, effective in very small concentrations, easy to distribute, and reasonable in cost. Certain of the glycols, i.e., propylene and triethylene appear to fulfil most of these requirements. They are non-toxic, essentially odorless, available, reasonable in cost, and their bactericidal action is dramatic in its effectiveness.[1] Until the low toxicity of these substances was established, large scale investigation could not be carried forward. The work of Robertson[2] and his coworkers has demonstrated that triethylene glycol (TEG) and propylene glycol (PG) are non-toxic, even in much greater concentrations than those which are required for effective bactericidal action for air sterilization.

Numerous tests have given evidence that effective killing of air-borne bacteria and viruses is accomplished by either TEG or PG vapor.[3, 4] Since practically all prior work had been done in small test chambers, it was evident that before full utilization of these glycols material could be possible and controlled studies of their effect in the reduction of cross-infections could be carried out, experimentation in full-scale chambers and with actual living groups had to be made.

We have shown that in our experimental room (10,000 cu. ft.) concentration of TEG ranging from 0.003 to 0.005 milligrams per liter (0.0013 to 0.0022 grains per cu. ft.) bring about instantaneous killing of bacteria sprayed into the space (Figure 1). Similar results are obtained with concentrations of 0.1 to 0.2 mg. per liter (0.044 to 0.088 gr. per cu. ft.) using PG.[5] A humidity of 35–45 per cent should be present to insure optimum effectiveness. Our tests have shown that bactericidal activity occurs exactly as had been demonstrated in the previous small chamber experiments.

The next phase of our study was concerned with the development of the

* Presented before the Engineering Section of the American Public Health Association at the Seventy-second Annual Meeting in New York, N. Y., October 13, 1943.

† The work described was done under contract, recommended by the Committee on Medical Research, between the Office of Scientific Research and Development and Northwestern University.

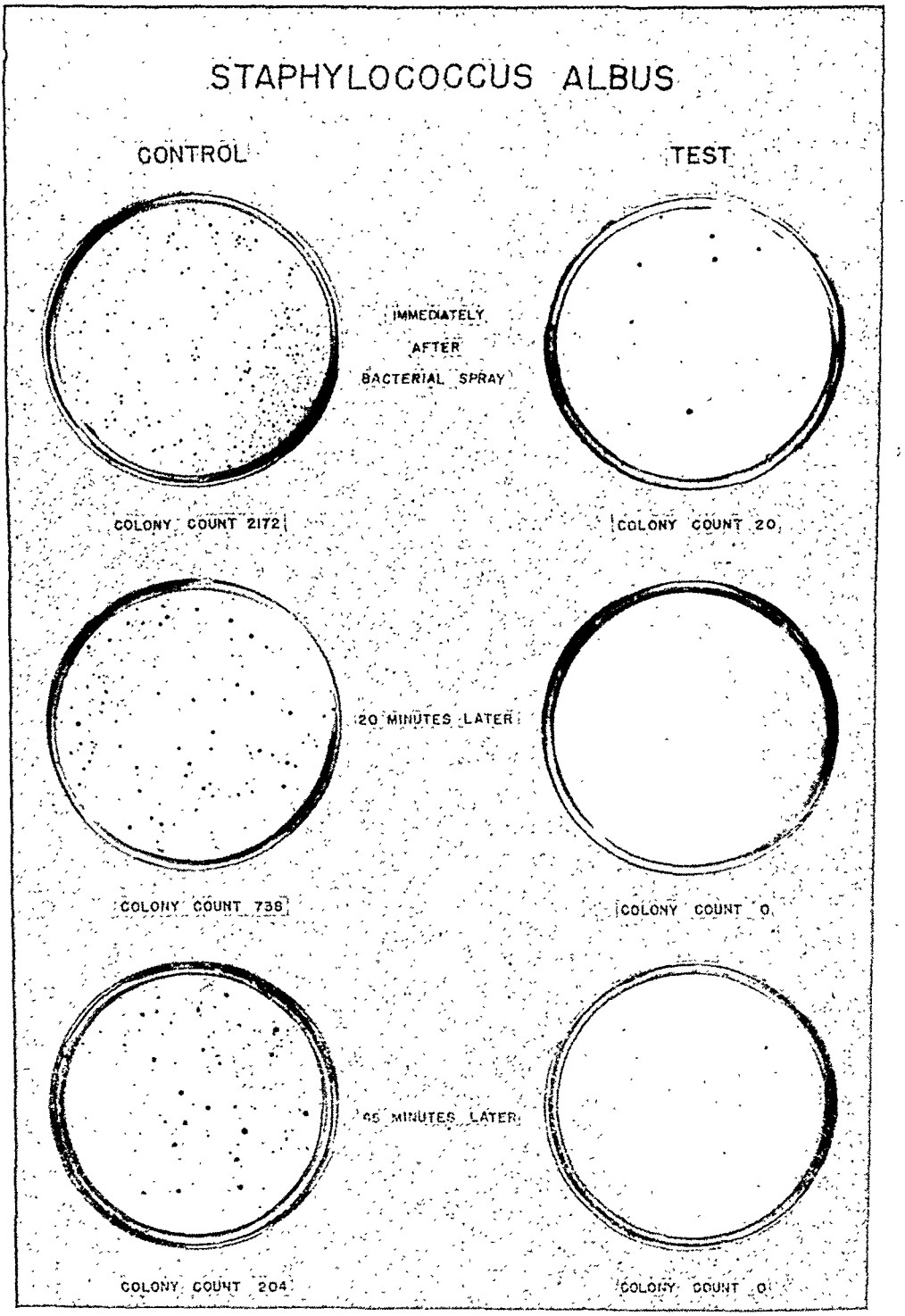


FIGURE 1—Bacterial plates showing the number of organisms per cu. ft. recovered after spraying an equal quantity of a standardized suspension of *Staphylococcus albus*. The room humidities were 45 per cent and the triethylene glycol concentration in the test was 0.004 mg. per liter.

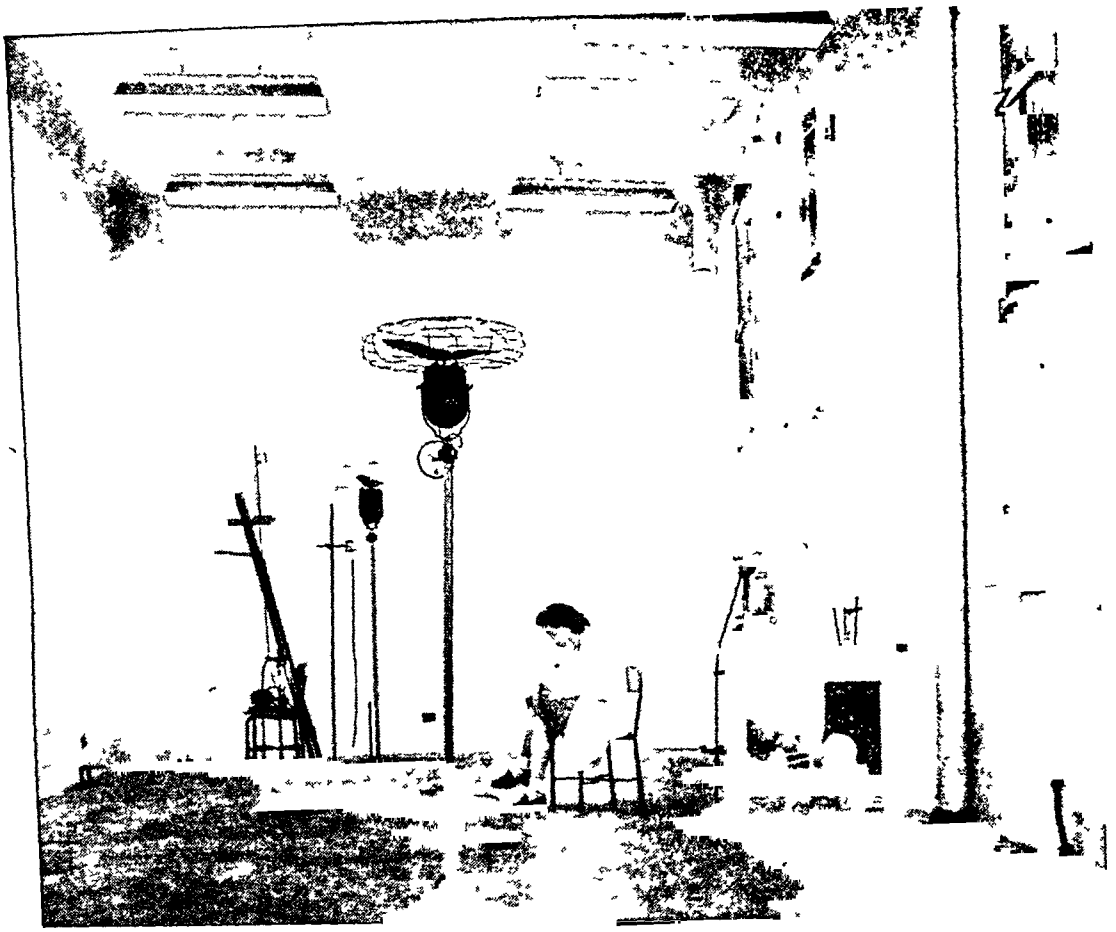


FIGURE 2—Test room showing apparatus for the introduction of bacteria and for air samples of glycol and organisms

engineering data required for the application of the glycols as bactericidal agents for occupied spaces.

TEST LOCATION

These tests were started at the Technological Institute, Northwestern University, in July, 1942. Use in particular was made of the large air conditioned test room of the Institute (Figure 2). This room is 38 ft. long, 17 ft. wide and 16 ft. high, and has an approximate volume of 10,000 cu. ft. It was insulated and extremely tight in regard to air infiltration or exfiltration. Large refrigerator type doors were used for entry and over each of the windows. This made it possible to observe the action of the glycol supply without having to consider large quantities of uncontrolled air. This room was connected to a complete air conditioning system, such that its temperature could be varied from —20° F. to +140° F., and its humidity controlled In the tests up to the present, it has not been found necessary to operate the air conditioning system.

SIGNIFICANT PHYSICAL PROPERTIES OF PROPYLENE AND TRIETHYLENE GLYCOL

Careful studies were made in order to ascertain the concentration of propylene glycol or triethylene glycol in equilibrium with air of a given humidity. These data are fundamental to the entire problem of the use of glycol vapor in air spaces. From such observations one may determine how great

or small a quantity of glycol and water vapor may be held in air at given temperatures and humidities, at what point condensation would be expected to occur, and at what point perceptible fog appears. Furthermore, as will later be shown, the final development of a practical "air-glycol atomizing humidities it will probably be impossible to maintain a consistently high glycol concentration in its vapor phase.

Before tests in living spaces could be attempted, the inflammability characteristics of propylene and triethylene glycol were studied intensively.[6] Our observations, in brief, showed that:

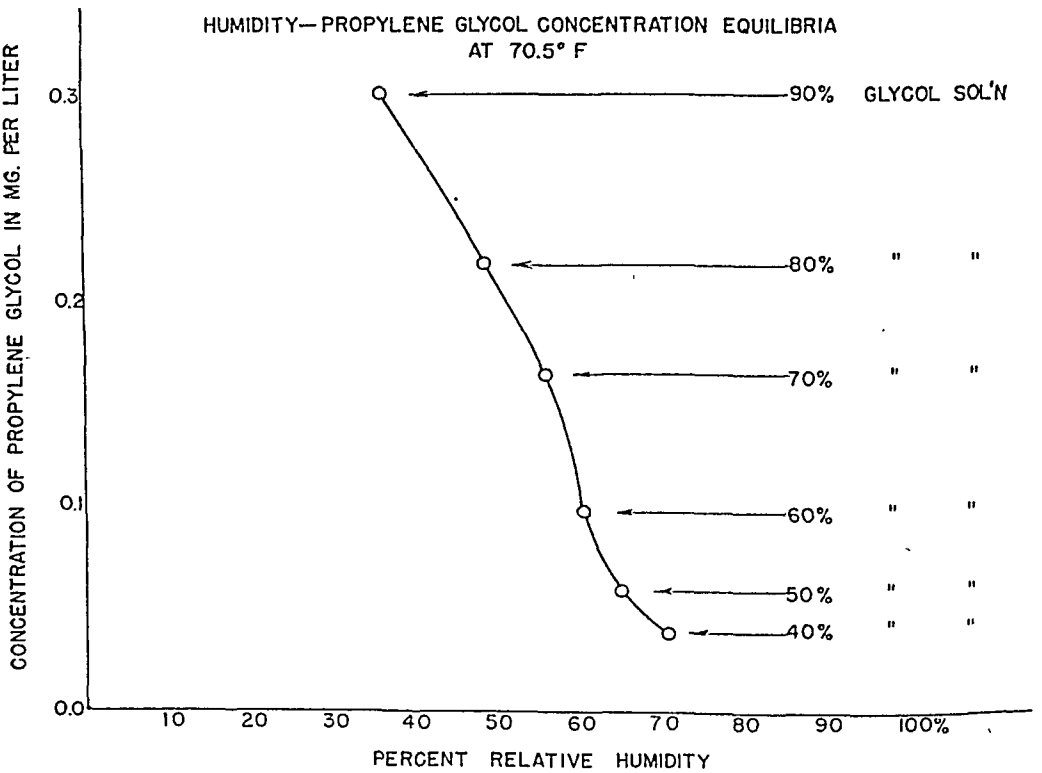


FIGURE 3—Curve showing quantities of propylene glycol and water in equilibrium at a temperature of 70.5° F.

scrubber" will depend upon a knowledge of these values.

As shown in Figure 3, preliminary data have been obtained. These data are being restudied, using both PG and TEG, by more precise technics so that more accurate values will be available. It may be seen, however, that at an arbitrary temperature, i.e., 70.5° F., the vaporization of water-propylene glycol solutions results in constant concentrations of water and glycol vapor in the air. Thus with high relative

1. The vapor-phase concentrations required for air sterilization were completely free of any fire hazard.

2. The presence of water in combination with glycol greatly reduced its combustibility. This was particularly significant, since samples of condensed material from surfaces as cold as —20° F. never contained more than 20 per cent glycol. It is impossible to ignite such solutions even with prolonged application of heat.

3. The introduction of small quantities of water with glycol renders large storage tanks relatively inactive as far as inflammability is concerned.

BEHAVIOR OF GLYCOL VAPOR IN TEST ROOM

Two effective means of generation of glycol vapor were developed and both were used in our experimental room. The first employed an atomizing principle, and the second generated the vapor by heating. Both methods showed that glycol vapor when delivered into the space had little or no tendency to stratify, it diffused readily through the space and, if air exchanges to outside spaces were kept to a minimum, the concentration decreased at a slow rate. There was evidence of a slight amount of absorption on room surfaces.

Since relative humidities of 35 to 45 per cent are desirable, condensation of water and glycol vapor takes place on cold surfaces, such as windows or poorly insulated walls in cold weather. The necessity for the maintenance of 35 to 45 per cent humidity also means that water vapor must be introduced into heated spaces during periods of low humidity, such as exist in winter. It has been found that the addition of water with introduced glycol can easily be made.

APPARATUS FOR GLYCOL GENERATION

As mentioned before, two means of glycol vapor generation were developed. The first utilized atomization of glycol water solutions of automatically controlled concentrations. In this method the solution is sprayed into a large mixing chamber containing a system of baffles to eliminate droplets. Equilibrium takes place between the air passing through the chamber and the sprayed solution. Complete and final data on the operation of this device have not as yet been obtained. However, the glycol water solution produces a definite concentration of glycol and water vapor in the air issuing from the outlet. It may also be seen that if the room air is recirculated through the mixing chamber it will pick up only the difference between its glycol content and the maximum content. The maximum possible glycol content depends on air temperature and on the glycol concentration of the atomized solution. When final details and refinements have been worked out, it will be possible to produce a vapor of constant concentration controlled by the amount and temperature of the air being passed through the atomized mixture and by the concentration of the liquid being sprayed. It should be observed that by fixing the solution concentration, the glycol content in air can never exceed a predetermined maximum at any room temperature. Vaporization of some of the atomized water also contributes to raising the space humidity. This method will probably be most applicable in the case of existing air conditioning systems with duct work in place.

The second type of apparatus developed was one in which water glycol solutions were boiled at constant temperatures. The concentration of the vapor emitted is dependent upon the glycol water concentration of the solution and the rate of production of vapor depends upon the rate of boiling, i.e., rate of heat input. Both the boiling temperature and the concentration in the reservoir can be automatically controlled. Thus, just as in the atomizing (scrubber) device, one can introduce controlled quantities of water vapor in conjunction with controlled quantities of glycol. This apparatus is small, compact, and easily portable so that it offers certain advantages over the first method.

SUGGESTED INSTALLATIONS

Although natural air and convection currents in a space tend to distribute the vapor to a certain degree, it is felt that some means of air agitation is very desirable. In ordinary living spaces of moderate capacity fairly uniform dis-

tribution can be obtained by the use of oscillating fans.

When larger installations are to be made, particularly in large gathering places, such as auditoriums and hospital wards, the use of a duct system plus a blower-type fan seems desirable. In the typical layout of Figure 4 a duct is located near the ceiling and at the center of the room, fitted with outlet grilles to allow uniform escape of glycol laden air. The volume of air to be moved is dependent upon the size of the space and the number of individuals present.

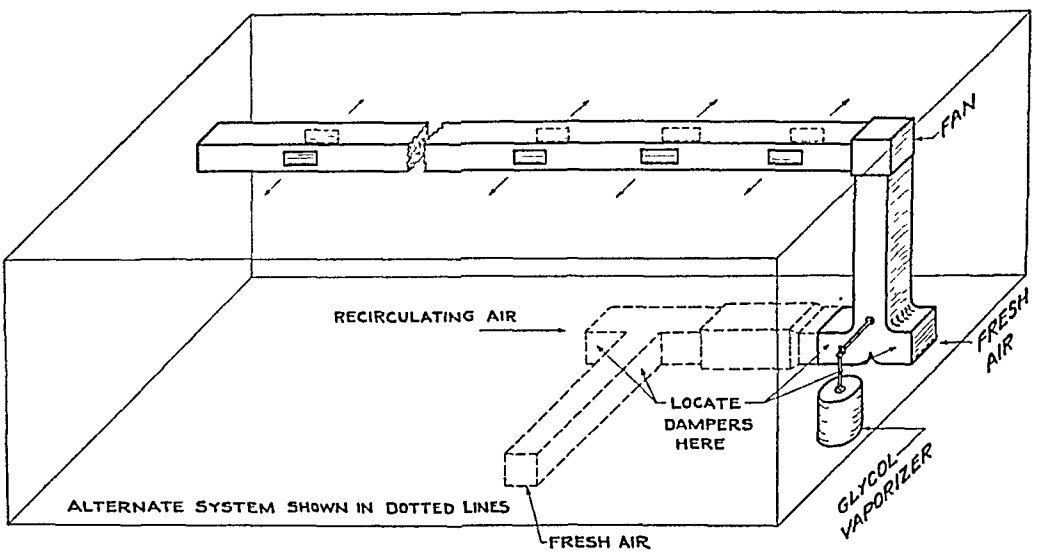


FIGURE 4—Diagrammatic illustration of suggested duct layout for glycol vapor distribution

The two types of glycol generators are shown, the atomizing (scrubber) device being indicated by broken lines. It may be seen that allowance is made for introduction of outside (fresh) air. Thus, all the air to be introduced must pass through or by the incoming glycol vapor and be mixed with it so that only "glycolized air" issues from the outlets in the duct. For best operation the room should be sealed as completely as possible and the relative quantities of fresh and recirculated air should be accurately controlled by means of dampers.

The ultimate answer to the rate of introduction of glycol vapor and water vapor will, of course, be dependent upon the rate of infiltration and exfiltration of air from outside or adjacent spaces.

MEANS OF DETECTION OF GLYCOL VAPOR

The final apparatus for practical application depends upon the development of a device which will readily detect adequate concentrations of glycol vapor in the treated space. This should operate in a manner similar to a thermostat, turning the glycol generator off or on in response to variations of glycol concentration in the room. Preliminary studies on several types of such devices are being carried out but none are as yet completely satisfactory. Thus, for our studies in living groups manual operation of the generator will be necessary.

DISCUSSION AND CONCLUSIONS

The data already obtained indicate

that the results secured in the laboratory should be equally applicable in occupied spaces. As yet no conclusions can be drawn as to whether bactericidal concentrations of glycol in the air of living spaces will significantly affect the incidence of cross-infections of air-borne disease. Other factors such as the amount of dust in the air, the proximity of one person to another and the virulence of the infecting agent, all play a rôle in cross-infection. However, one would expect that the presence of a " bactericidal curtain " surrounding each individual would reduce the possibility of that individual transmitting or receiving virulent organisms. Final conclusions must depend upon adequate and well controlled field trials which are now being organized.

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Favorable and Adverse Developments in the School Environment*

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IN a recent bulletin issued by the Committee on Administrative Practice of the American Public Health Association (*Health Practice Indices*) a series of charts are shown indicating the range of accomplishments in various fields of community health service. The material had its origin in the *Evaluation Schedules* submitted for the National Health Honor Roll for the years 1941 and 1942. The health practices summarized in the pamphlet may be assumed to be reasonably indicative of the progress attained in the different health services of some of the more progressive communities.

It is disconcerting, therefore, to note that, of the rural school children served with satisfactory water supplies, the median group still shows a deficiency of almost 20 per cent. As the pamphlet itself indicates "There are all too many areas where rural school children are forced to use unsatisfactory water supplies with their attendant potentialities as sources of water-borne illnesses."

For over one-quarter of the total number of communities surveyed satisfactory water supplies are unavailable to rural school children to the extent of from 35 to 70 per cent of the children involved.

In the case of satisfactory means of excreta disposal, the situation is somewhat better, although in the median group of rural school children approximately 10 per cent are still unprovided with satisfactory excreta disposal facilities. In one-quarter of all of the communities analyzed, unsatisfactory means of excreta disposal are provided for anywhere from 25 to 80 per cent of the rural school children involved.

This none too flattering picture might be excused by some on the score that the situation is much better in the case of urban communities. Unfortunately such data as are at hand do not confirm this optimistic hope. In one community of over a million people, for example, approximately 10 per cent of the school children still have substandard sanitary facilities which would not be acceptable on any appraisal sheet. There is reason to believe that the physical environment of schools, both in rural and urban areas, is typical of the few instances here presented.

We need not blame the war effort for any major adverse developments in the school environment, except in so far as the war has intensified or stressed the obvious deficiencies and has been responsible, of course, for deferring at least some important correctives. Bear-

* Presented at a Joint Session of the American School Health Association and the Food and Nutrition and the School Health Sections of the American Public Health Association at the Seventy-second Annual Meeting in New York, N. Y., October 13, 1943.

ing this fact in mind, therefore, it is important to view the school environment as one which required attention over a long series of peace years rather than one which the contingencies of war have created. A simple explanation of these deficiencies of physical facilities of various schools, both rural and urban, resides in the fact that those interested in the health of children have moved rapidly toward the personal hygiene activities which promise and accomplish so much in lifting the level of the health of the school child. Unfortunately, these efforts have too frequently been founded upon defective underpinning of an environmental type. In other words, advances in medicine and in application of the results of medical research have been so rapid that the purely physical aspects of the school received less attention than 25 years ago, except perhaps in the direction of architectural aesthetics. Corresponding emphases on sanitary control of the school structures were lacking. These lapses are particularly unfortunate since the schoolhouse, from the lowest to the most lavish structure, should be the demonstration center for the education of children in the primary tenets of public health practice.

The best use of the school and its environs for the protection and permanent education of the child still lies in providing therein, not the more expensive, but the most adequate sanitary features which modern technology can provide. This is only loosely accomplished in a community where for many years one of the best places to demonstrate the most insanitary type of drinking fountain was in the most recently constructed public school, where school superintendent, architect, health commissioner, public health nurse, and sanitary engineer apparently were never introduced to each other.

Some people have facetiously referred to many of the newest public schools as the concealed museums of unused air conditioning equipment. Here, too, the art of the salesman has outstripped the efficiency of intercommunications between school and health authorities. No inventory has ever been made of the amount of money invested in air conditioning equipment which has never performed a single revolution in fact since the date of its installation. That there are such, even a modest observer of schoolhouses could disclose.

The protection of the school environment, therefore, in so far as the sanitary engineer is concerned, has shown violent fluctuations from the provision of little or nothing to that which was too expensive and at times unnecessary.

The war has merely stressed these deficiencies and has piled them up. The war is not responsible, however, for the fact that in many expensive as well as inexpensive structures for school children natural and artificial light is poor; that in some vocational schools the conditions in the automobile repair shops are inferior to those which would be permitted in a commercial establishment for the same purpose; that in too many schools for colored children the toilets are dilapidated, lice and fleas infest the school, and the waste from drinking fountains and sinks finds its way comfortably to the nearest street surfaces; that in many of the most modern urban school systems in the country neither towels nor soap are provided for the school children to wash their hands after using toilet facilities, even though health department posters, gracefully designed to instruct the children in these habits, are prominently posted in the various toilets and washrooms.

It did not take a war in 1939 to disclose that hand-washing facilities were virtually absent in the school system of a number of large cities because the cost was considered by the school board to be prohibitive.

In other major cities of the United States, as late as June, 1939, schools for colored children were provided with outside privies, with no seat covers, with the pits not fly tight, and sufficiently odoriferous to be reminiscent of the textbooks of 1900.

It was not war which caused illness, in a large number of students, from fumes and gases in one of our most distinguished school laboratories because of the lack of adequate artificial ventilation, generally demanded under state regulations for industries. Nor was it war that made the classic location of illegal cross-connections in one of the most important high schools of a large city.

These examples are culled from the reports of various school surveys which have or have not found their way into the literature. They are impressive in demonstrating the conviction that long before World War II we had the elements of a major public health war in the field of school environment, in which the antagonists were within the departments of education and of health. This does not mean that equally excellent examples cannot be given of accomplishments and of coöperative effort between the departments of education and of health. There are many such, but the examples of the absence of such positive coöperative effort are still too many to be comforting to either the educator or to the health officer. Since these situations have become intensified because of war and because they will confront all of us in increasing degree as soon as peace is declared, the remainder of this paper will be devoted to outlining some of the elementary features of school environment, the control of which the members of the American Public Health Association may profitably take to heart. Most of these details are probably familiar to all of you. Perhaps they are so familiar that it is reasonable to ignore them even in the installations. In rehearsing them for you some renewed interest may be generated in applying those sanitary standards and practices to the future which have been in the textbooks for many years in the past.

Much of our lifetime is spent in the home, the school, and the work place. Witness the family as they break up after breakfast for the day's work. The father leaves for the office or factory environment, the child for school, and the mother remains in the home. Many of the same fundamental considerations of sanitation apply to each of these environments. In *Preventive Medicine in Modern Practice* (edited by the New York Academy of Medicine) it is suggested that it would be well for experts in the hygiene of housing to participate always in the planning of new schools. It is easy to see how the problems of illumination, ventilation, heating, water supply, sewage disposal, fire hazards, and general housekeeping require the same fundamental engineering considerations, whether applied to the environment of 15,000,000 school children of the country or to the environment of the 50, or 60,000,000 workers.

Of course for a comparatively small percentage of workers exposed to special hazards specific to some manufacturing, mining, and mechanical industrial plants, there are special industrial hygiene problems in the control of dusts, fumes, mists, and gases, and in protection against accidents.

The school environment is planned by architects and engineers and is operated and maintained by the school custodian under the general supervision of principals. To the extent that the architect, custodian, and principal understand and appreciate the requirements of a healthful environment and to that extent only, will the new schools and the major alterations to existing schools be designed and constructed to

promote good and prevent ill health. Improvements and maintenance of existing schools are likewise planned by superintendents, business managers, and other officials of the boards of education. It is important that the school environment be planned to complement the hygiene program of the school and the health department. The problem is both medical and engineering and, where these services are available and interested, the health department can play a very useful and effective part in furnishing understanding and appreciation by translating health objectives into designs and specifications.

The problem of influencing the school board and superintendent is not unlike that of influencing other departments of government in order to accomplish needed improvements. The taxable wealth of the community, the political situation, the progressiveness of the community, and the personalities involved are basic considerations influencing the decision how best to handle the problem.

When Memphis, for example, began to give some thought to a program of school sanitation a few years ago it was found on inquiry that a rather complete course in hygiene had been prepared jointly by a committee of teachers and nurses. Sanitation was not referred to in any way, and the activities of the Bureau of Sanitation were not mentioned. The sanitary engineer had not indicated by any planned activity in the schools any interest in the school environment as a whole beyond that of restaurant inspection and of checking connections to public water and sewerage systems. A first move was to survey all of the schools of the city. A form was developed for reviewing each schoolroom and for scoring each school building from the standpoint of design, construction, and equipment, as part I, and maintenance, operation, and educational effort, as part II. Because of the variation in the illumination found in individual rooms and the many factors involved in providing satisfactory illumination, it was necessary to record these items for each room on a separate sheet.

As the survey progressed the superintendent of schools was acquainted with the results and he became much interested in the information which was being developed. A summary of scores for the first 23 schools surveyed was prepared and submitted. This was the health department's estimate of how the various schools compared with each other and where improvements were needed. This estimate could be compared with their own evaluations. A program of improvements was made up each year, and money was set aside for them in the budget. The superintendent asked that the business manager of the board be kept informed of the progress made and that all reports and plans be filed in his office. The business manager expressed considerable interest, and asked that specifications for drinking fountains to meet the health department's approval be drawn to guide him in the purchase of about 1,000 nozzles for replacements for the next year. Soon a request came from the architect that tentative plans for a new school be looked over for criticism and recommendations before final plans were drawn. This was done, and recommendations were incorporated in the final plans.

This brief statement of experience in one city is included only to indicate how quickly confidence and coöperative effort may be established. Sound engineering advice is appreciated and will command respect. It is frequently suggested in connection with schools, housing, water supply problems, etc., that "the health officer should advise the appropriate officials on matters concerning public health." Unless backed by study and a knowledge of the

principles involved, such advice is not specific enough and frequently is overlooked until too late to mean much. Plans submitted after construction has gotten under way or even after the plans are complete cannot be readily changed. This is just as true for schools as for water supply improvements.

It would serve no useful purpose to list herein the detailed technical features to be covered in school building design and equipment, for these are readily available in current standard texts. It is important, however, to emphasize and reëmphasize that a sound coöperative program between the health and education departments must be based on the respect and confidence of the board of education and on the obvious qualifications and tactfulness of the health officials for dealing with the environmental problems. The minimum necessary steps to provide the satisfactory physical structure and equipment are as follows:

1. Survey of the school plants (master survey)
2. Yearly inspections plus coöperative assistance from the nurse
3. Definite reports and recommendations to be made at the right time in order to receive consideration when the budget is being planned
4. Approval of plans by the public health engineer, in consultation with the school architect
5. Preparation of specifications for sanitary equipment, such as fountains, syphon breakers, dish washing equipment, new lighting systems, etc.
6. Active interest in the educational material used in teaching public health in the school

When peace comes, the school will be revivified. New and delayed structures will be built. Now, however, is the time for the health department to make its joint plans with the school department for the introduction of sound, economical, and safe standards and practices into the school environment. This is one field where simple familiar structures and equipment should not be forgotten because they fail to stir the imagination of the crusader. They do protect lives and safeguard well-being.

Resources of Industry for Health Education*

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INDUSTRY is a vast and complicated machine. Beside it our public health structure has an embryonic simplicity in spite of the miscellany of societies, associations, councils, committees, funds, foundations, institutes, departments, services, and bureaus with which we are familiar. The resources of industry in men, money, and experience are of course enormous, but these must be applied to creating production, jobs and profits. When its resources are applied to health education, that is incidental to its fundamental purposes. Health education is not an end in itself for industry as it is for health educators. In spite of this diversity of approach the two groups can work and have worked together for mutual advantage.

Industry provides organized and reachable groups of people to work with. It spends large sums for advertising, publicity, and promotion, of which millions of dollars are aimed at education of the public in matters of health and sanitation. Health educators in general have been prone to watch industry's health education efforts from afar with scorn, approval, condemnation, criticism, or compliment after the effort has occurred. Seldom have they tried to guide these efforts. On the whole health educators have been quicker to condemn the bad than to accept the good. But the results might more often be good if health educators would take positive, aggressive action to make them so.

For example, I have seen a pamphlet published by a manufacturer of a commodity which every public health worker would agree had unmistakable public health value. The pamphlet had good art work, clear type, an excellent editorial style. Great and expensive talents had gone into the preparation of a piece of educational literature which in attractiveness and effect seldom is equalled by non-commercial publishers. However, in his zeal and ignorance, the manufacturer had made health claims for his product which were not scientifically justified. And, moreover, with a dim consciousness that a health officer might be looking over his shoulder, he failed to stress values of his product that were wholly sound both from selling and educational standpoints. That publication was rejected by health educators. It failed to have its fullest value for the manufacturer. Here was a resource of industry for health education which was wasted both for health education and for industry.

Recently the government in its nutrition campaign has shown in a big way how business resources can be tapped for health education purposes. Millions of business promotion dollars have been spent under the direction of

* Presented before the Public Health Education Section of the American Public Health Association at the Seventy-second Annual Meeting in New York, N. Y., October 12, 1943.

the Food Distribution Administration for nutrition education. As a result public funds were conserved, coöperating businesses were flattered by the implied partnership, and the nutritional message reached the people promptly and effectively.

Long ago the Metropolitan Life Insurance Company demonstrated with its Educational Advisory Committee how a business organization can team up with health education for the benefit of itself and the public health.

These are two patterns of coöperation which could be extended to other fields. Other patterns to meet other conditions can be devised. Constructive action of this character is the best antidote for objectionable advertising.

In the last analysis health depends to a very great extent on things which are bought and sold. There is hardly a health education message which is not a promotion for one or more products of industry. For instance—Drink pure water—has meant business for the manufacturers and purveyors of cement, pipe, fixtures, and purification apparatus.

Drink more milk—brought more business and better prices to farmers, breeders, feed producers, dairy equipment suppliers, and even carpenters and masons to build barns and silos. When we insisted on pasteurizing milk, that opened a whole new field of profit. Our laws and regulations on dishwashing in public eating and drinking places if enforced mean more business for the purveyors of soap, detergents, chemicals, hot water heaters, tanks, racks, and laundries.

Furthermore, if industry were not ready to provide the capital and take the business risk involved in producing these essentials for the public health, many of our educational recommendations would be incapable of fulfillment.

Since it is clear that many industries could not exist without the public health program and that public health requirements could not be met without industry, it is hard to understand why such a gulf exists between the two fields. Speaking as a health educator, it seems to me that we should have no hesitancy in requesting an industry to aid us in a program without which that industry might never have come into being. And speaking for industry I see no reason why it should not ask health educators to assist it in health education programs which after all are the educator's chief concern. The Public Health Education Section could most appropriately take the initiative in bringing about such a coördination of effort, which would tap tremendous new resources for health education.

If such collaboration is to take place it may be profitable to examine the organization of industry as it exists for this purpose. There are:

1. The individual manufacturers, producers, processors, and converters with their wholesalers, jobbers, retailers, and distributors—Examples in this class are: General Electric Company, Campbell Soup Company, Lederle Laboratories, and United Fruit Company.

2. The service organizations, including public utilities—Examples in this class are: The American Telephone and Telegraph Company, New York Central Railroad, John Hancock Mutual Life Insurance Company, American Railway Express.

3. The trade associations—Usually these are horizontal combinations of competitive companies in the same field, such as: The American Soap and Glycerine Manufacturers Association, the American Meat Institute, Portland Cement Institute, California Association of Citrus Fruit Growers.

4. Agencies which are especially created by industry groups for research, educational and promotional purposes, such as: The Portland Cement Association, National Dairy Council, the former Cleanliness Institute, and the new Nutrition Foundation.

5. The advertising and publicity agencies employed by industry, among which some of the better known are: Young and Rubicam, J. Walter Thompson, Edward L. Bernays, and Ivy Lee.

In each of these categories there are

many organizations whose business advantage is so closely related to public health progress that there should be little difficulty in quickly developing mutually advantageous coöperative programs.

In the meantime, how can health educators utilize the resources which already exist? Most of us are aware of the availability from industry of a great wealth of pamphlets, posters, movies, and other auditory and visual aids. In spite of the constant efforts of the producers of this material to secure its wider use, the worker in the field often does not know of its existence and at a distance is unable to determine its value for his particular situation. The American Film Center has helped to meet this need in the motion picture field by publication of its annotated list of health films for lay audiences. Until similar compendiums of information on other types of materials are prepared it will be necessary to rely on the information offered from time to time in the magazine *Channels* and in the *American Journal of Public Health.* Unfortunately there is no central agency which continuously makes it its business to see and evaluate health education materials. Nevertheless most of the large national voluntary agencies, including the National Health Library, can usually give some information on resources or suggest other points of inquiry. Undoubtedly the best single source of information is the National Publicity Council and its regular exhibits at the A.P.H.A. meetings. Its information relates to materials from all sources, including industry. It must be remembered, however, that in all information received from such central sources, there has been a conscious or unconscious evaluation of the material in question by the individual who answers the inquiry. This usually makes it desirable to secure information from several sources, and necessary to interpret recommendations (which may be conflicting) on the basis of one's own judgment and knowledge of the conditions under which the material is to be used. The time does not seem ripe for developing a " Seal of Acceptance " for health education materials, such as exists for drugs, foods, and therapeutic devices. In the meantime, Dr. Bauer, Dr. Galdston, and others [1, 2, 3] have suggested certain broad criteria to guide us in the selection of material.

In addition to the *materials* which industry can furnish us for our use we should not overlook the fact that industry also offers great groups of men and women to work with. These groups are organized and reachable. Many big industries have developed their own programs of health education, though these have frequently been limited to safety education. Organized labor also has a growing interest in health education. But a great opportunity still exists for health educators to broaden the safety message into a general health message and to work with large and small groups of workers in the same way that they have learned to work with other organized and reachable groups.

Although industry offers materials for our use and groups that we can reach, it has another resource of far greater potential value than either of these. This is its advertising in newspapers, magazines, radio, and elsewhere. Use of the health appeal in advertising is not new. The following about a then popular dentifrice is from *Peterson's Ladies National Magazine* for 1877:

> Among all the disagreeable consequences that follow the decay of the teeth, an impure breath must be the most mortifying and unpleasant to its possessor, and it is the most inexcusable and offensive in society; and yet the cause of it may easily be removed by cleansing your teeth daily with that justly popular dentifrice, Fragrant SOZODONT. It purifies and sweetens the breath, cools and refreshes the mouth, hardens the gums, and

gives a pearl-like appearance to the teeth. GENTLEMEN WHO INDULGE IN SMOKING should cleanse their teeth with SOZODONT, as it removes all unpleasant odors of the weed. Sold by all Druggists.

Because of claims like this and others which were not well founded, health educators have been justified in their skeptical view of much of the material relating to health which has commercial sponsorship. But many changes have occurred since 1877. Fifty years later *Better Times* [4] editorialized on the excellence of the campaigns and materials which were then emanating from commercial groups. Since then Dr. Bauer and others have pointed out that advertising is not necessarily bad health education just because it is advertising.

Nevertheless, I think all here will agree that much of the present-day advertising is still somewhat less than perfect from the health education standpoint. As far as health education is concerned, it is a resource that is frequently going to waste, if not worse. One might overlook this waste if it were not so tremendous.

To us who are accustomed to modest budgets its size is truly staggering. A quick review of the ten magazines of largest circulation for the month of September, 1943 (counting only one issue of each weekly) indicates that approximately half of all advertising stressed or featured health in one way or another. These ten magazines had a gross circulation of approximately 32½ million copies. The first twenty have a gross circulation of more than 50 million copies. Assuming two readers for every copy, which advertisers consider a small estimate, and counting the weekly publications four or five times a month, the gross readership of twenty leading national magazines is better than 150 million a month. When one adds to that the impact of hundreds of lesser publications (including the pulp magazines), newspapers, radio, car cards, billboards and other mass media, it is obvious that through advertising, the equivalent of every person in the United States is reached not only once, but many times a month. And even if we do not extend our computation for the ten largest magazines in which half of this advertising deals with health, we still have a minimum audience of 60 million people every month in the year. No one will doubt that this is considerably more than the combined total reached by all of our official and voluntary agencies through all of their channels.

September is not one of the biggest advertising months, and the war theme which runs through much advertising today serves to curtail the amount of health advertising. Nevertheless, some 2½ million dollars was spent on health advertising in this one month (again counting weeklies only once) in just ten magazines. This is at the rate of 30 million dollars a year. What the annual figure would be if one included all magazines as well as other advertising media I have not computed. These figures are enough to indicate however that the impact of advertising is, to put it mildly, somewhat greater than the impact of professional health education. Elsewhere I have commented on this comparison and raised the question whether health educators or advertisers are going to do the job of health educators.[5] If anyone believes that the impact of advertising is merely massive and not effective, consider the wide use of laxatives against the recommendation of the medical profession. I suspect that even in this group more of us drink orange juice for breakfast because of what we saw in the advertisements than because of what we read in the textbook. Here, then, is the greatest single resource of industry for health education and it is being used largely without our help and often without our blessing. It constitutes our biggest challenge

today. We must look for a way to use this resource for a healthier nation.

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Dr. Cumming Receives the William Freeman Snow Award

The American Social Hygiene Association has announced the recent award to Hugh Smith Cumming, M.D., Director of the Pan American Sanitary Bureau, Washington, former Surgeon General of the U. S. Public Health Service, of the William Freeman Snow Award for distinguished service to humanity. The award was presented in recognition of Dr. Cumming's 50 years of public health service, during the entire period of which he has been identified with the U. S. Public Health Service.

Dr. Cumming is a graduate in medicine of the University of Virginia in 1893, and has received honorary degrees from the University of Pennsylvania in 1930, and from Yale in 1933. He served as Surgeon General of the U. S. Public Health Service 1920–1936. He has been Director of the Pan American Sanitary Bureau since its organization in 1920 and has been a member of the Health Committee, League of Nations, since its creation and Vice-President since 1937. Dr. Cumming served as President of the American Public Health Association in 1931.

Modern Malaria Control*

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THE word "modern" in the title of this paper is almost superflous because all technical malaria control practices are relatively new. Herms and Gray, the authors of the modern text on the subject, were both prominently identified with the first anti-malarial mosquito campaigns in the United States as recently as 1910.

To the engineer malaria control measures involve the mechanics of reducing exposure of the human host to the potent vectors of the disease. This is accomplished by controlling production of the vectors through attack on the aquatic stages, segregation by mosquito proofing, house spraying to destroy the adult engorged female anopheline, and the use of repellents. Chemotherapy and prophylaxis by drugs are excluded as control media. In reference to this, a recent release from a national committee on tropical diseases states in part:

> Malaria infection rates have never been controlled by drugs. If malaria control is the proposed purpose of suppressive treatment, then it is not advisable. . . . Wholesale suppressive treatment would only serve to increase the number of sub-clinical cases. It is much better to let attacks become apparent through frank paroxysm and then give full therapeutic medication. . . .

Pending discovery of a drug or a biological preparation harmless to human beings and completely efficient in destroying the parasites in the blood, the control of mosquito vectors remains the most effective means of reducing the *infection rate.*

Undoubtedly, the easiest method of malaria control is by the depopulation of an area. Where malaria is hyperendemic, this is apt to be the natural course of events as the birth rate invariably falls below the death rate. Many peoples in highly endemic areas have learned by experience, folklore, or tribal taboo to depopulate certain areas during that portion of the year when transmission is probable. The hillmen of the Burma Road country depopulate the valleys at night during the warm parts of the year, thereby remaining a relatively healthy, vigorous race as compared with the malaria-ridden tribes of the lowlands. The Tennessee Valley Authority, a leader in modern malaria control practices, has used with success the general principles of depopulation. For example, in certain areas where the control of the malaria vector is economically infeasible, "night leases" are negotiated which permit land utilization during daylight hours but forbid trespassing by night.

Basically the technics of controlling production of mosquitoes have changed but little. Larviciding, filling and draining of standing water remain the cardinal principles involved, but refinements have made our present-day procedures more efficient and economical.

The first break in the old practice of

* Presented before the Engineering Section of the American Public Health Association at the Seventy-second Annual Meeting in New York, N. Y., October 13, 1943.

using any available petroleum oil as a larvicide was the recognition and adoption of oils having known toxicity, satisfactory spreading qualities, and a degree of volatility that would assure some hours of maintenance. Determination of these qualities can be made in the field with very simple equipment.

In 1921 Barber and Hayne published their trials with Paris green as a dust applied to the water surface to kill anopheline larvae. King and Bradley adapted the method to airplane dusting in 1925. Pyrethrum was introduced in an oil emulsion by Ginsberg for special uses.

Present war needs and the attendant threat of oil and Paris green shortages have accelerated the search for a more perfect larvicide. Within the last few weeks there have been enthusiastic reports on a new insecticide. According to preliminary reports application of unbelievably small amounts of this material effect control which persists for a period of time much longer than that obtainable by use of our present-day insecticides. One report, which smacks of facetiousness, records the destruction of anopheline larvae in a control pool by the inadvertent passage from a treated pool to the control pool of a flock of ducks.

It is almost axiomatic that all new insecticides make their initial appearance heralded by the statement that here at last is an " insecticide to end all insecticides." Time records few of them, however, that do not develop insurmountable obstacles to their effective use. Let us hope that this particular one is an exception. If it will accomplish one-half of what is now claimed for it, it may well prove to be one of the outstanding salvage values of the war.

Draining and filling as applied to mosquito control are engineering practices that change as little as the laws of hydraulics. In the main, antimalarial drainage proceeds through three stages:

1. Temporary ditching to draw off surplus water so that the terrain may be worked
2. Semi-permanent ditches, excavated to grade, sloped, smoothed, and otherwise made adequate for immediate mosquito control purposes but requiring annual maintenance
3. Permanent structures such as concrete inverts, lined ditches, and underground drains

For installations in endemic areas the ultimate, and eventually the most economical, solution is the permanent type of construction. However, for emergency work or for areas of doubtful permanency such construction may not be justified. For the same energy much more semi-permanent work can be achieved. Further, where the balance between transmission and non-transmission is slight, as is often the case in areas of low endemicity, the construction of semi-permanent ditches is all that is needed to overbalance the scales in favor of non-transmission.

In impoundments the full development and practice of cyclic water level fluctuation has been a notable factor of recent years. For smaller impoundments automatic syphons have been used with success.

One of the most progressive improvements in malaria control practice has been the introduction of species sanitation. Formerly control of malaria mosquito production was largely by general mosquito control. The procedures established in the last war constituted one step in advance in that they prescribed the drainage only of standing water which produced anopheline mosquitoes. Today we have rather firmly established the point that in continental United States, out of the twelve species of the genus *Anopheles* capable of transmitting malaria in laboratory trials, only three—*A. quadrimaculatus* in the East, *A. freeborni* in the West, and *A. albimanus* in the Rio Grande Valley, are found to be significant vectors. With this information as a guide,

the present mosquito control team consisting of an engineer and entomologist can survey an area and eliminate from further consideration great acreages of standing water that would have been included previously in control operations.

Particularly striking in this respect are the enormous expanses of cypress swamps in which breeding of *A. crucians* is intensive throughout their extent, but in which *A. quadrimaculatus* occurs only in trifling numbers. The latter can be controlled by dusting or spraying the sunlit edges where this species may reproduce. The economy of this practice becomes immediately obvious. I might here interpolate, with due humility, that the engineering profession has gradually accepted the entomologist in an associated partnership. The history of the present emergency control program should firmly establish the entomological malariologist as an essential entity of the modern malaria control team.

As you know, malaria transmission is dependent on simultaneous occurrence of human cases of the disease and potent anopheline vectors. Malaria vectors occur in practically every state in the union. Also, it is probable, particularly with the dislocation of populations by movements of armed forces and migrations of war workers, that human malaria carriers have been widely scattered throughout the nation. However, there has resulted, as yet, no noticeable extension of the endemic centers of malaria.

The reason for this is found in a third factor which must be present in order to produce endemic malaria—the proper "ecologic niche." This properly vague factor is a combination of natural and man-made circumstances. If favorable, these circumstances help to overcome the mathematical odds against transmission. If unfavorable, they lengthen the odds and make transmission more difficult to the point where it approaches mathematical improbability.

A review of a simple case may help to illustrate the importance of this point. Malaria is a disease of warm countries. Its distribution makes this obvious; the optimum temperatures for the development of the parasite in the body of the mosquito, ranging from 71°–86° F. depending on the species of *Plasmodium*, confirms the point. With the same combination of mosquitoes and human carriers, the parasite is going to have a much smaller chance of striking favorable temperature conditions for its development in mosquitoes in northern Michigan than in southern Georgia. If, in addition to the unfavorable temperature, the few parasites that are ingested in warm, favorable periods of weather find themselves in the bodies of mosquitoes that inhabit well screened communities, the chances are that the parasite will be pumped into oblivion in the blood stream of non-human hosts.

From this it is apparent that as the natural environment for the propagation of mosquito vectors and the malarial parasites approach optimum conditions, the more stringent must be the artificial protective devices. Conversely, of course, the more unfavorable the natural conditions, the greater will be the effect of small expenditures of time and effort on malaria mosquito control or protective devices.

Herein probably lies the reason why endemic malaria is now largely confined to the southeastern portion of the United States, with the exception of a few isolated areas such as the valleys of California, Oregon, and New Mexico. In some cases, conscious mosquito control operations have hastened the decline of malaria in the regions outside the present endemic areas. In the main, however, these areas have "outgrown" their malaria unconsciously through screening, agricultural drainage or

reclamation, improved housing, and intensified use of the land.

In endemic areas these incidental measures do not interpose sufficiently adequate hurdles to prevent continued transmission and we must resort to control measures specifically designed to meet the needs of the situation.

Up until the last war the Cuban and Panamanian demonstrations were not applied to any extent in this country. A decided impetus was given to interest in anti-malaria measures at the community level by the program executed in extra-military zones during 1917 and 1918. This U. S. Public Health Service program extended to 43 areas in 15 states over a total area of about 1,200 square miles. It demonstrated the values accrued, and trained a relatively large group of technical workers for civilian employment in this field.

Since 1918 there has been a progressive strengthening of antimalaria organizations in the southeastern states. The annual number of cases has steadily declined as control efforts and improved living conditions have removed the disease from the cities and larger towns and from many smaller communities. Thus have been removed the worst foci of infection from which malaria spreads epidemically during that part of its biological cycle when its virulence and intensity are increasing.

The secondary impetus furnished malaria control by the various works relief programs in the " thirties " doubtless aided the recession of endemic areas. During this period over 86,000 miles of drainage ditches were constructed in the southeastern United States. With man power and materials of little consequence, the prime objective of the time was the elimination of breeding areas by antimosquito drainage.

The advent of the present war emergency, with the concentrations of military and industrial mobilization in malarious areas, necessitated antimalarial measures to prevent the expected cyclic rise of the disease. This program, Malaria Control in War Areas, a joint undertaking of the U. S. Public Health Service and the several state health departments, is designed to control production of malaria mosquitoes and reduce potential malaria transmission in extra-cantonment zones of military and essential war industrial areas. It is emergency malaria control; a program of preventive medicine. The guiding policy is to provide effective protection with a minimum expenditure of man power and material.

The program complements similar activities of military authorities within the reservation limits. At present, control operations are carried out at 1,200 war establishments located in 22 states, the District of Columbia, and Puerto Rico. In the past year, 13,000 acres were cleared for larvicidal operations, about 5,000 miles of ditches were cleaned, and over 5,000 acres of breeding surface were eliminated by 1,100 miles of drainage. Over 12,000 lineal feet of ditches were lined with durable materials. About 7,000 lineal feet of underground drainage was installed. In this construction one-half million pounds of dynamite were used, as well as draglines, bulldozers, and other power equipment. In the larvicidal operations, airplane dusting, together with heavy power equipment mounted on boats and trucks, aided in conserving man power.

Full advantage is taken of entomological science and the practice of species sanitation. In many areas entomological surveillance replaced costly control operations.

As yet little public information is available on malaria control methods as practised by the armed forces under combat conditions. A review of war theaters leaves little doubt that malaria is the number one disease confronting

our military leaders. The history of malaria in World War 2 will make interesting reading.

The extensive antimosquito drainage of the " thirties," the highly scientific emergency program at present, together with the military experience abroad, should provide the background from which will emerge modern malaria control as a true science. Fundamentals are well established; the overall prospectus is clear. It remains only for competent leadership in the medical, entomological, and engineering professions to translate these fundamentals into practice. The cardinal principles of modern malaria control will be an associated partnership of these three sciences, full development of species sanitation, intelligent integration of basic control principles into modern developments, recognition of conservation interests, and full use of educational media to stimulate individual and community effort. The day of the amateur malariologist will be past. Malaria control no longer will be simply " pouring of oil " or " digging of ditches." It will consist of highly trained men working in a coördinated and supervised organization. Eradication of *Anopheles gambiae* in Brazil has demonstrated the effectiveness of an efficient organization.

It may well be that the next major challenge to the malariologist in the United States will result from the impact of large numbers of returning troops from malarious areas. Dr. Louis L. Williams, Jr., of the U. S. Public Health Service, has proposed a challenging hypothesis—that of eradicating malaria from continental United States. Dr. Williams proposes an anti-anopheline attack in the persistent endemic areas and the activation of mobile antimalaria units to control the expected explosive outbreaks that are anticipated in those areas outside the endemic foci. More will be heard of this proposal in the near future.

Malaria in humans is a disease. The medical profession must take responsibility for overall leadership. Having determined vector control essential, medical science defines the endemic foci, the entomologist determines the density and breeding areas of the malaria vector; the engineer applies the mechanics of engineering science to accomplish control. Where the related principles of all three sciences are not coördinated there is sacrificed effectiveness or efficiency, or both. The future outlook for malaria prevention is good. Its ultimate eradication from the continent is well within probability. Time will tell what use is made of these opportunities.

The United States Chamber of Commerce Public Health Program*

HOWARD STRONG

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THE United States Chamber of Commerce believes that all businessmen should be, and it knows that many are, interested in national and community health and particularly, of course, in industrial health. The Chamber with its 2,000 organization members, is in a position to stimulate this interest and to secure layman support for the national and local health programs, the major responsibility for which must certainly rest with the federal, state, and local health departments, with the voluntary health agencies, and with the medical profession.

The Chamber of Commerce health program has, of course, certain definite limitations and, I think, definite possibilities. We cannot, nor shall we try to contribute to technical health knowledge. That is the job of the laboratories, the research institutes, the medical and health agencies—public and private—and the medical, dental, and engineering professions. We certainly shall not presume to tell the doctors what to do—they must tell us. But the program, we hope, can contribute materially to the spread of the knowledge which we have and to its application and use—an application which you know better than we, has lagged far behind the usable knowledge and technics which are available.

The Chamber health program is under the supervision of our Health Advisory Council, which is made up of thirty-two outstanding authorities in the medical and health field, with Dr. James S. McLester as General Chairman, Dr. W. G. Smillie, as Chairman of the Community Health Committee, Dr. Leverett D. Bristol, Chairman of the Industrial Health Committee, and Dr. James E. Paullin, Chairman of the Individual Health Committee.† These are men whom you all know, and in whom you have confidence. We realize that our work must be done with and through the U. S. Public Health Service and other federal agencies, the state departments of health, the local health departments and medical societies, and the great voluntary organizations such as the American Public Health Association, the American Medical Association, and many specialized agencies. We shall count on you to keep us within the bounds of professional soundness.

Our major job, then, is to assist in public education and to secure layman support for the activities which you will develop. My experience indicates that too many businessmen and laymen look on community health ac-

* Presented at a Joint Session of the Industrial Hygiene and Health Officers Sections of the American Public Health Association at the Seventy-second Annual Meeting in New York, N. Y., October 14, 1943.

† Dr. Bristol has recently succeeded Dr. McLester as General Chairman, and Dr. Anthony J. Lanza has succeeded Dr. Bristol as Chairman of the Industrial Health Committee.

tivities as an expression of an overdeveloped, and perhaps not fully warranted, professional enthusiasm and the health department as a useful luxury, but not always as a major essential service. We must help to establish the validity of the health program and assist in creating an insistent community demand for the knowledge and services which you, the professional men and women, are in a position to provide.

The American Public Health Association in its declaration of Desirable Minimum Functions and Organization Principles for Health Activities says, "Health departments should be responsive to public demands. The scope and policy of public health work will depend upon the stage of development of medical, sanitary, and related sciences, and upon *the readiness of the public to support their effective use.*" This implies, of course, the existence of such a demand. Cannot the layman's organization be useful in creating this demand on the part of the community, to which most health departments will readily respond if that demand is coupled with the assurance of financial support sufficient to meet it? We must help to create a willingness that tax money shall be spent to supply the services which are available. And cannot such an organization, too, assist in establishing sounder public relations for the health department, a better understanding of its work and its needs, a closer relationship between the citizens and their official medical staff?

The National Chamber health program, as it is developing, seems naturally to fall into two categories.

1. EDUCATION

Printed material, always professionally approved, of course, will be prepared for widespread circulation. This may include a periodical dealing with current health subjects of interest and importance to the layman, for distribution among workers and to homes and citizens generally; timely news releases and articles for newspapers and a variety of house organs and magazines; subject matter for radio and public addresses; and specialized material from authoritative sources, or our digests of such material, for distribution to special audiences. This educational material should cover all major phases of health knowledge and practice, with special emphasis on industrial health, and with particular attention to women in industry and the children of working mothers, nutrition, tuberculosis, and venereal disease, the expansion and support of hospitals and constant effort to strengthen and support local public health services. It must, of course, carry an editorial style and text adapted to the specific levels and audiences which are to be activated. Such an educational program should bring not only a better understanding of ways to sounder health but should help to create a demand and supply the means to provide for the services necessary to realize our objective.

A prospectus outlining this program has been distributed to leaders of public thought throughout the nation and to organization executives.

2. ACTION

It is not enough to create an intelligent understanding. This understanding must be translated into action, particularly at the community level. The modern Chamber of Commerce does not limit its activities to the interests of business alone. It is concerned with every activity which makes for the welfare of the whole community. Hundreds of chambers of commerce have set up health committees, composed of physicians and laymen, which are effective instruments in securing community understanding and backing for the health department and its program, and

which sometimes, it must be added, have been useful in stimulating the health department to undertake a broader field of activity. This phase of the National Chamber program is being directed not only to local chambers of commerce, but to health councils and other community organizations which are or should be interested.

In the development of any community health program, it is our feeling that the first step is to know the facts, to make an inventory of current health activities and needs. The National Health Honor Roll which, for fourteen years, has been conducted by the American Public Health Association and the National Chamber, provides an effective means for such an inventory, with its *Evaluation Schedule* and its analysis supplied to each participant. We hope that the Honor Roll may become less an effort to obtain distinction and the national recognition which goes with it, and with the communities sometimes resting on their laurels when they have obtained a place on the Honor Roll. It should become more a stimulus to aggressive action, with the evaluation schedule and the analysis as guideposts to the next steps which must be taken toward the fulfillment of a well rounded and adequate program. We expect the Honor Roll to be continued as a major project in the Chamber's health program, and with this objective definitely emphasized.

Two methods of approach are being used in this action phase of our program—the shot gun and the rifle. We are sending to all member community organizations, and others as we make contact with them, material which we trust will be definitely helpful in securing local action and in intelligently guiding that action. A booklet outlining practical methods for setting up a community health committee or council and suggesting the major activities which should be included in the program, has been distributed to these organizations. The Committee on Administrative Practice of the American Public Health Association has revised the *Evaluation Schedule* and simplified the procedures to adapt them to wartime pressures. A pamphlet setting forth the procedures, together with entry blanks, has been sent to all member organizations. Special effort is being made to secure wide participation in this activity. A plan for joint medical services for small industries and an industrial medical self-evaluation schedule, prepared by Dr. Leverett D. Bristol and Dr. Anthony Lanza, will be made available to industrial and other employers. A pamphlet on nutrition, with special emphasis on its industrial phases, is under way, and the Council is coöperating with the War Production Board and the War Food Administration in the distribution of effective material in connection with the "Food-Fights-For-Freedom" Campaign.

The first issue of an occasional bulletin emphasizing various aspects of the Community Health Program and reporting actual accomplishments in this field, is being prepared. This will go to organization executives. Other documents are being planned and will be developed as additional needs indicate. These publications are interspersed with individual letters and occasional personal visits. Thus a widespread effort to create a broader community interest in public health is being put forth. This is the shot gun method.

We have felt too that the Chamber can well select certain communities for special service in intensified local programs and use these communities as demonstration areas to serve as an example and inspiration to others. These programs can become foci of infection for extending community health thinking and action to other centers. A group of New England organization

executives has already met to consider this proposal, and several are now making plans for an intensive program. State health departments have agreed to coöperate and give their assistance. Other groups will be called together and we believe that a considerable number of communities can, in this way, be stimulated to increased action. The assistance of a number of national organizations in these local programs has been assured.

The Council is also developing a consulting service to assist communities in solving their special health problems. Technical questions will be referred to members of the Council or to professional organizations and individuals. We believe that we, in the Chamber, can be helpful in this way.

Thus are we using the rifle method, picking out our target and aiming at the bull's eye.

In all of this activity, most certainly, the health of the worker, who is the backbone of our national prosperity, must be emphasized.

Now may I suggest a project which, it seems to me, would stimulate an orderly national and local health program, and upon which I should like to have your thinking.

After many years of effort, as you all know, every state in the Union has passed laws requiring the reporting of vital statistics. As this reporting becomes more complete and efficient, a vast store of statistical information is being accumulated and is proving of inestimable value as a background against which our public health program is being planned and carried forward.

The American Public Health Association has demonstrated the efficacy of an annual evaluation of the health activities of a community with full-time health services, not only as a measure of accomplishment, but as a directive for future action. Is there not some way in which other communities also could enjoy the benefits of this annual appraisal? I am thinking particularly of those communities which do not have full-time health services. May we not look forward to a universal annual or biennial evaluation of the health services of all our community health departments? Such an evaluation would be conducted under the aegis of the state health departments and be brought together by the U. S. Public Health Service or some other central agency, as a measure of current activities and a guide and directive for future action. Perhaps this evaluation would serve as a stimulus to better equipped departments and more extensive public health protection. The significant work of the American Public Health Association in this field could well attain its logical fruition in such a national policy. It would be a long and arduous task, and it is, perhaps, a somewhat idealistic proposal, but I think it well worth serious consideration.

I have outlined an ambitious program and many other activities will develop as we go along. The program cannot be realized immediately, nor can it be realized at all without the guidance and help of you who are carrying the torch in the field of community and industrial health. The Health Advisory Council hopes and believes that we shall have that guidance and help.

Newer Procedures in Laboratory Diagnosis and Therapy in the Control of Bacillary Dysentery*

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THERE has been recently a renewed concern for the acute diarrheal diseases and, concurrently, a substantial advance in the knowledge of these disorders. It is the purpose of this report to review this newer knowledge as related to the problem of control.

GENERAL OBSERVATIONS

Rational control of disease rests upon reliable diagnoses. To obtain these in the diarrheal diseases, a revision is needed of the prevailing concept of the clinical characteristics which warrant a consideration of *Shigella* infections. In our clinical series of 555 proven positive cases, the most frequent manifestation was a "simple diarrhea." The classical bloody mucoid stools were notably infrequent; indeed, these scarcely entered into the clinical picture of Sonne, Schmitz, or mild Flexner infections, and were not a prominent feature in severe Flexner cases. Also the onset was marked quite frequently by a prominent fever but only mild enteric symptoms, suggesting "flu" rather than dysentery. The very name bacillary dysentery accounts for many of the missed diagnoses. A designation referable to etiology and freed of its present misleading clinical implications would be preferable. We therefore use and recommend the name "shigellosis" for all infections due to pathogenic *Shigellae*. Thus shigellosis is to be thought of as a possible, and in many areas as the most probable, diagnosis in the common variety of acute endemic diarrhea and in an uncertain proportion of cases so loosely designated "intestinal flu."

The manifestations of shigellosis vary widely. In the young the illnesses are frequently grave, occasionally fulminating, whereas in older children and adults the disorders are usually mild. Furthermore, in the young, *Shigella* infection ordinarily results in definite illness, while in older children, adolescents, and adults very mild disorders and subclinical infections are much more common than significant clinical disease. Furthermore, regardless of age of the patient or severity of the disease, infection usually persists beyond clinical recovery. The duration of the convalescent carrier state is commonly three to four times that of the total duration of symptoms. For control, due attention must be given to carriers, convalescent and passive, and

* Presented at a Joint Session of the Epidemiology, Health Officers, Maternal and Child Health, and Laboratory Sections of the American Public Health Association at the Seventy-second Annual Meeting in New York, N. Y., October 14, 1943.

to cases with disturbances of little clinical significance.

Shigellae may be spread in various ways; the relative importance of these must be weighed in formulating control procedures. We found no evidence, in our own experience, which suggested water-borne infection. Milk was notably free of suspicion, since the poor, who suffer most from diarrheal diseases, generally purchase the less expensive canned or dried product. There was some evidence of spread through contaminated food, but this appeared of minor rather than major importance. Where it did occur, usually multiple carriers were found among the food handlers and kitchen helpers. The disease and flies did thrive under similar conditions. Still, cultural evidence suggested that flies rarely harbor viable *Shigellae*. We isolated this organism from flies only once in repeated trials. In contrast we recovered these pathogens with comparative ease from the fingers or from under the finger nails of known cases and carriers. Considering all evidence we are of the opinion that *Shigellae* are transported from group to group through the movement of infected individuals. Within the household and in other groups living together the organisms are most commonly passed from person to person through direct or indirect contact. Among institutional inmates the negative evidence excluding other channels of spread was strikingly clear in several outbreaks. Hence the control of infected individuals (including personal cleanliness) is of much greater importance in the prevention of bacillary dysentery than has been believed.

Explosive epidemics of shigellosis suggesting a common source and single exposure are rare. Ordinarily, an epidemic starts with sporadic infections which gradually become more numerous, the early cases preceding the recognized outbreak by 2 to 4 weeks or more. The total prevalence, which increases gradually, usually reaches a level of between 10 and 33 per cent. Total incidence of primary attacks (clinical and subclinical) in unmodified outbreaks may approach 100 per cent and counting reinfections has gone even beyond this. Clinical cases, which are most numerous early in the outbreak, decline promptly following the peak of the epidemic, but the total prevalence decreases slowly because of persisting convalescent and passive carriers. The duration of an unmodified outbreak is weeks rather than days. Obviously, throughout this prolonged period a rich source for the spread of infection is maintained. The slow evolution of *Shigella* epidemics provides the need and the *opportunity* for the application of control measures.

LABORATORY PROCEDURES

The advances here have resulted in a simplication of bacteriological technics and a marked increase in the reliability of cultural tests. The development and introduction of the highly selective media which grow the enteric pathogens while inhibiting almost all the nonpathogens was of major importance. Earlier we used desoxycholate-citrate agar, now we employ S. S. (Shigella-Salmonella) agar which has grown satisfactorily all strains of *Shigellae* encountered. In the study of known *Shigella* outbreaks this culture medium only is used for primary plating. A heavy fecal inoculation may and should be employed; to obtain this the usual cotton-tipped applicator coated with feces is satisfactory. This makes it convenient and practicable to collect specimens by rectal swabs and to inoculate the plate directly by "painting" the entire surface of the agar with the swab. The device for taking the rectal swab which we recommend is a small rubber tube large enough to contain the cotton-tipped applicator. The

distal end is cut on a bevel and its external surface is lubricated before use. The applicator alone can be used for infants; in adults, also it may be inserted with little discomfort if the cotton tip is moist. The collection of fecal material for culture by this method involves only the skill required in taking rectal temperatures. The whole procedure is so simple that the responsibility for obtaining and plating of cultures can be entrusted (following instruction and demonstration) to a nurse, attendant, or technician.

This procedure opens a new approach to control. It is now practicable to culture large numbers of individuals for the identification of carriers of *Shigellae*. The plates, prepared and numbered, the sterile swabs, lubricant, and record sheets are taken from the laboratory to the group to be cultured. There the responsibility is divided, one person taking the swabs, a second inoculating plates, a third writing names and culture numbers, and one or more preparing the patients. When the latter are ambulatory, cultures are taken at one place, the patients coming in line, bending over while the swab is being obtained, and leaving by a separate exit. If the work proceeds smoothly, cultures can be taken at about the rate of 200 per hour. It requires more time to handle patients in bed where the materials must be taken from ward to ward. In the presence of an outbreak, the individuals being cultured rarely object, providing the swab is taken by a considerate person of the same sex.

Simplified steps recommended for a prompt and reliable identification of pathogenic *Shigellae* in an identified outbreak are as follows:

Suspicious colonies are picked to Kligler's iron agar (Russell's double or Krumwiede's triple sugar agar is satisfactory also). Despite the heavy fecal inoculum on the plate a high percentage of pure cultures are obtained if the suspicious colony is touched only at its elevated center without "scooping."

Organisms "positive" for *Shigellae* on this medium are directly inoculated to three sugars, mannitol, xylose, and rhamnose. A needle is used and dipped in succession into the three tubes. The fermentation reaction after 24 hours' incubation differentiates organisms found in this country as follows:

	Mannitol	*Xylose*	*Rhamnose*
Flexner (including Boyd's 88)	+	−	−
Sonne	+	−	+
Schmitz	−	−	+
Alkalescens	+	+	−

Tube agglutination tests are also set up immediately using growth from the Kligler's slants. Three diagnostic sera are employed, polyvalent Flexner (including Boyd's 88), Sonne, and Schmitz. A supply adequate for several days is diluted to one or at most two dilutions below the titer of the anti-serum. One-half or 1 ml. of this is added to small test tubes. Using a needle, a small amount of growth from the slant is transferred to the tube and is readily brought into a smooth suspension. If the probable variety of the organism is known, only one tube is needed; if not, Flexner and Sonne are both used. Except in outbreaks, Schmitz anti-serum is employed only when indicated by the sugar reactions since this organism is rarely found in endemic cases. Positive agglutination tests may be recorded and reported after 2 to 4 hours in the water bath, but negative readings are delayed till the following morning. For examinations under the conditions stated these simplified tests reliably identify most suspicious organisms isolated. For the few which are neither clearly negative or positive more extensive cultural tests are used. Further procedures are re-

quired when other pathogens, as *Salmonellae,* may be involved.

Enteric bacteriology in the past was difficult, time consuming and often unproductive. That situation no longer holds true. Culturing for *Shigellae* is now one of the simpler laboratory procedures and these tests may be done in substantial numbers when needed, provided the laboratory is not far removed from the individuals to be examined.

THERAPY

Attention is limited in this study to the use of sulfonamides in shigellosis.

The following method has been used in evaluating the relative efficacy of different sulfonamides in *Shigella* infections. Cultures were obtained before treatment and at daily intervals after the beginning of medication. All were taken by rectal swabs and S. S. agar plates were inoculated immediately in a uniform manner. The number of clear suspicious colonies per plate was counted (or estimated) and representative types picked for identification. Medication was dispensed in individual boxes or envelopes bearing the patient's name and directions as to dosage. Treatment was continued until at least two consecutive daily cultures were negative. Post-treatment follow-up examinations were obtained. Control cases in adequate numbers were similarly followed. Blood counts and urine examinations were ordered twice weekly on some, not on all, to obtain evidence of any minor toxic reactions. Sulfonamide levels in the blood and in fluid feces (following saline laxative) were determined on series of cases receiving the different sulfonamides. Up to the present over 1,500 individuals known to be infected with *Shigellae* (Flexner, Sonne, or Schmitz) when treatment was started, have been studied. In all, ten sulfonamides were used. The major observations were these:

All sulfonamides had some influence in cutting short the duration of these infections.

Flexner strains responded promptly (with very rare exceptions); Schmitz infection was slightly more resistant; while Sonne cases and carriers cleared least satisfactorily.

The poorly absorbed sulfonamides, though given in larger doses, had no demonstrable superiority in effectiveness in Flexner or Schmitz infections and the response was less satisfactory in one regard. The interval between the beginning of medication and a clinical or bacteriological response was longer with the poorly absorbed than with the absorbed preparations.

Sonne infections were more resistant to all sulfonamides. The best results were obtained with large doses of sulfasuxidine. All but a small percentage responded in a little longer time to the absorbed sulfonamides; the resistant cases were handled best by changing to sulfasuxidine.

Toxic reactions were rare (not observed with poorly absorbed sulfonamides) as would be expected with treatment usually terminating in 7 days or less.

Cases and carriers responded equally well to chemotherapy.

Concerning the choice of sulfonamides there need be no rigid rules. Sulfanilamide or sulfapyridine is not recommended. Other absorbed sulfonamides (sulfapyrazine, sulfadiazine, sulfamethazine, sulfamerizine, and sulfathizole) are acceptable. The first appears to have slightly superior properties, the last to be less effective. Among the poorly absorbed compounds, we regard sulfasuxidine as superior to sulfaguanidine and reserve judgment on "sulfathaladine."

We recommend, therefore, that the treatment of shigellosis (cases or carriers) begin with an absorbed sulfonamide. Follow-up cultures should be taken not later than the 4th and again

on the 6th day of treatment. If these or any subsequent two cultures are negative, the individual may be released. If they are positive, and particularly if the organism is "Sonne," a change to sulfasuxidine would be desirable. When cultures cannot be obtained, a treatment of 5 days for Flexner and Schmitz and of 7 days for Sonne is recommended.

A satisfactory dosage for adults for all absorbed sulfonamides is 1 gm.; of sulfaguanidine and sulfasuxidine 5 gm.; and of sulfathaladine 2.5 gm.; all four times daily. Double these amounts may be given as the initial dose. Children (between 25 and 75 lbs.) receive one-half the adult dosage; infants, 0.065 gm. of absorbed sulfonamide per lb. of body weight per day, and proportionately larger amounts of the poorly absorbed compounds. Amounts smaller than the above have been used and found effective in Flexner infections.

APPLICATIONS

The reliable diagnosis of communicable diseases on an etiological basis is an accepted objective in public health practice. The diagnosis of the diarrheal diseases is far below standard since the necessary bacteriological tests are infrequently employed. The simplification of the technic of fecal cultures makes it practicable to recommend that more laboratories and particularly the smaller clinical laboratories be encouraged to make this diagnostic procedure readily available. State health department laboratories would need to give leadership, instruction, and supervision. The agglutinating anti-sera also might be provided, and it could be agreed, if deemed advisable, that all suspicious positive cultures would be sent to the state laboratory for full identification.

The prompt institution of sulfonamide therapy in the young is required to prevent deaths and to speed recovery. However, in older children and adults with the milder clinical disease, chemotherapy has it major importance as a control measure, where it is used to prevent and terminate carrier states.

Early diagnosis and specific therapy are of particular importance when the case is the initial infection in a susceptible group. Adequate attention to such cases and to their contacts is considered of major importance in the prevention of institutional outbreaks. Here we advocate the bacteriological diagnosis of all acute diarrheal disorders which continue for more than 24 hours, or which in the first 24 hours are accompanied by fever or other symptoms. If two or more cases occur within a week in a group having common living quarters, all members of that ward or dormitory should be cultured. Such a program is viewed as practicable when the tests can be done in the institution's own laboratory, or in another one nearby which can function as such.

Kuhns [1] has described a control program for an army service command in which, in addition to strict sanitary measures, he advocates the bacteriological diagnosis of all cases of diarrhea, and the treatment of positive cases and recognized carriers with sulfonamides. Presumably procedures may be modified to meet the varying needs of military medicine.

Though advocating methods designed to aid in the prevention of outbreaks, we recognize that assistance in control is usually requested after the outbreak is well established. Ordinarily on the first survey at least 10 per cent of the group are proved infected, and this percentage may reach 35 as was found in a military unit in Puerto Rico. Under this condition the following procedure has been used repeatedly with satisfactory results:

Infected individuals are identified through the immediate examination of all with symptoms and by cultural

TABLE 1

The Control of Outbreaks of Shigella Infection through the Use of Sulfonamides

Group	Average Population	Variety of Infection	Number of Infected Individuals Found on Cultural Surveys: Days Before Treatment 11–16	7–10	4–6	1–3	Day Treatment Started	Days Following Beginning of Treatment 2–3	4–6	7–9
A	195	Flexner	42	..	55	46.5*	44	16	4	1
B	194	Flexner	32.5*	31	..	26	22	3	3	0
C	188	Flexner		23	..	32	28	4	1	0
D	200	Flexner		..	..	..	61	18	0	0
E	140	Sonne		..	..	22	22	17	11	6
F	70	Sonne		..	..	17	15	12	8	1

* Average of two surveys

surveys. All cases are treated with the onset of symptoms and all carriers on identification. Surveys are repeated usually about twice weekly. If practicable, infected individuals are isolated from the group and are treated with sulfonamides until discharged after two consecutive negative cultures. The group is regarded as free of significant infection when no positive individual is found on two successive surveys.

The results of such a program in a military unit have been described by Cornell, Watt, and Dammin.[2] Further illustrative findings are shown in Table 1 (Group A and B). Cases of dysentery began to occur in late March, 1943, among the inmates of two neighboring cottages in an institution for the mentally defective. Clinical cases only were treated at first, while both groups were followed by cultural surveys. From March 29 to April 13 all in Group A were examined 5 times. The prevalence of the infection was at a high level throughout. Then all individuals positive in any of the last three examinations and all additional positives revealed on subsequent surveys were placed on treatment. The prevalence rapidly fell to a low level as shown. However, the first entirely negative survey was on May 13. Group B was handled similarly. From April 4 to 22, clinical cases only were treated and there were five surveys with the findings shown. During this period the prevalence declined moderately. However, after beginning the treatment of all individuals known to be infected, it dropped promptly to a low level. The last positive was found on the 6th day after this procedure was started. In the subsequent 4 weeks, all individuals were culturally negative in each of four surveys. In these and in other groups the occurence of clinical disease was promptly prevented by this control measure. Also a high total prevalence was readily reduced to a low one, but it was frequently difficult and in some groups impossible to attain the goal of complete eradication of the infection.

A second approach to the control of established outbreaks is now under investigation and a progress note is offered. Here sulfonamides are used "prophylactically" or as it might better be described for "mass therapy" with minimal doses of the drug. Heavily infected groups, having a combined population of 1,646 have been observed. On this treatment, as with that described above, there was a prompt reduction to almost complete disappearance of clinical cases. The total prevalence of Flexner infections declined with striking rapidity as is illustrated by Groups C and D in Table 1. Sulfadiazine 1 gm. twice daily was used in the former, sulfapyrazine 0.5 gm. twice daily in the latter. The preva-

lence of Sonne infection under small dosage (1 gm. of poorly absorbed and 0.5 gm. of absorbed sulfonamide twice daily) declined more slowly, though the course of infection in the treated groups was modified favorably. Groups E and F treated with sulfadiazine and sulfapyrazine as above are illustrative. Risks are recognized in this "prophylactic" use of sulfonamides. Resistant strains might be developed which would tend to spread in spite of continued medication. Also, the immediate and remote effect of this dosage on the individual must be examined further. Thus the varied aspects of this simple approach to control require continued critical study.

These newer procedures cannot replace the established methods designed to prevent the spread of fecal pollution. We join in emphasizing the importance of sanitation and personal cleanliness. However, these additional supplementary methods of control are now available and are most applicable where diarrheal diseases are most troublesome, i.e., in institutional groups and military units. They can be used most simply and we believe most effectively in the prevention of outbreaks. The handling of widely distributed epidemics is more difficult because of the amount of laboratory work involved. Here the epidemiologist or administrator will need to evaluate the present and potential gravity of the outbreak and adjust control procedures accordingly.

CONCLUSIONS

1. The requirements for more effective control of *Shigella* infections include reliable diagnoses of mild as well as severe cases, a recognition of the rôle of carriers and more direct attention to the individuals infected.

2. The slow evolution of *Shigella* outbreaks provides the need and the opportunity for the application of control procedures.

3. Laboratory technics for the identification of *Shigellae* have been simplified and increased in reliability.

4. A free use of cultural tests for diagnostic purposes and for the identification of carriers is practicable.

5. Well absorbed sulfonamides, as well as poorly absorbed preparations are effective in *Shigella* infections, and are recommended.

6. Prompt diagnosis and immediate specific treatment of initial cases and early carriers is advocated for the prevention of outbreaks.

7. In the handling of established outbreaks, cases and carriers may be identified through diagnostic tests and cultural surveys and all discovered infected individuals treated till culturally free of *Shigellae*.

8. The merits of "mass therapy" with minimal doses of sulfonamides are not yet securely established.

9. These newer control procedures have a proper place among the methods now available for the prevention of *Shigella* infections, particularly among institutional inmates and in military units.

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The Problem of Falsely Doubtful and Positive Reactions in the Serology of Syphilis*

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AT no time more than at present has the problem of falsely doubtful and positive reactions in the serology of syphilis commanded as much attention and importance. This is not only due to legally required serologic tests before marriage and during pregnancy, but to the testing of thousands upon thousands of selectees for the Army, Navy, and other services, as well as of thousands upon thousands of civilian donors of blood for the preparation of plasma.

However, while doubtful or positive reactions occurring in presumably non-syphilitic individuals are always very disturbing and place a heavy responsibility upon physicians in relation to their clinical interpretation, this present widespread employment of serologic tests for syphilis is not without the great advantage of discovering unsuspected cases of the disease. This in turn usually results in appropriate treatment which is not only of benefit to the individuals concerned, but to the public at large by way of reducing the chances of its transmission to others.

Following the discovery of the Wassermann or complement-fixation and various flocculation tests for syphilis, falsely positive reactions were reported from time to time with practically all methods, not only in a large number of various non-syphilitic diseases of human beings but in presumably normal non-syphilitic individuals as well. But up to about fifteen years ago they were thought to be due largely to technical errors, except in the case of leprosy and malaria. Since then, however, and especially during the past eight years, the results of annual interstate serologic surveys conducted by the U. S. Public Health Service in coöperation with the American Society of Clinical Pathologists, have clearly shown that biologic falsely positive reactions may occur not only in a number of non-syphilitic diseases and conditions but in presumably normal non-syphilitic individuals as well. I refer especially to these serologic surveys because the Committee on Evaluation of Serodiagnostic Tests for Syphilis have not only selected syphilitic and presumably non-syphilitic donors with commendable care and skill, but because all specimens were submitted to various author-serologists themselves in whose laboratories it may be reasonably assumed that technical errors were reduced to a minimum. For these reasons, therefore, I have largely confined myself in this study to an analysis of the results reported by author-serologists and state laboratories in the

* Presented before the Laboratory Section of the American Public Health Association at the Seventy-second Annual Meeting in New York, N. Y., October 12, 1943.

TABLE 1

Sources of Technical Falsely Doubtful and Positive Serologic Reactions

(A) Due to Errors in Collection Resulting in Contamination or Hemolysis	*(B) Due to Errors in the Laboratory*
Bacterial contamination	Insufficient skill and experience
Chemical contamination from unclean containers	Failure to follow technic exactly as described by author-serologists
Using oxalate or citrate	Mix-up of specimens
Improper storage of specimens	Improperly prepared glassware
Delay in sending specimens to laboratory	Faulty reagents
Mislabelling of specimens	Inexact measurements
Post-mortem specimens	Inadequate controls
	Improper reading of reactions
	Errors in recording and reporting reactions

nine serologic surveys begun in 1935, including the Washington serology conference held in 1941.

DOUBTFUL REACTIONS

While the committee has adopted the plan of penalizing laboratories one-half point for a doubtful reaction occurring in a presumably non-syphilitic individual and crediting one-half point for a doubtful reaction in the case of a syphilitic individual, in this study I have preferred to list doubtful reactions on the same basis as positive reactions, as was the policy of the committee in the first survey held in 1935. In practice at least it has been my experience that doubtful reactions occurring in presumably non-syphilitic individuals require almost as much consideration from the standpoint of clinical interpretation and management as weakly positive ones, and especially if repeatedly doubtful. Furthermore, while single doubtful reactions should never alone be the basis for the diagnosis of syphilis, neither should they be completely ignored because the disease is unexpected, and especially since they are sometimes the only evidence indicative of possible chronic latent syphilis, either congenital or acquired.

TECHNICAL FALSELY DOUBTFUL AND POSITIVE REACTIONS

Unfortunately there are many sources for falsely doubtful and positive reactions due to technic. As summarized in Table 1, these may be divisible into those incident to the collection of blood resulting in excessive contamination or hemolysis, and thereby usually attributable to the physician himself, and those attributable to faulty technic in the laboratory. Certainly all serologic tests, regardless of their technical simplicity, require skill, experience, and scrupulous attention to all details regardless of how inconsequential they may appear. For this reason the Committee on the Evaluation of Serodiagnostic Tests for Syphilis has always placed proper emphasis on the advisability of technicians conducting the tests exactly as described by their author-serologists. And, needless to state, the incidence of technical falsely doubtful and positive reactions varies according to the skill with which the tests are conducted; consequently, no test can be better than the laboratory conducting it. Under the circumstances it is to be expected that the incidence of falsely doubtful and positive reactions due to errors in technic will increase under present conditions because of the large number of technicians with insufficient training and experience being rushed into serologic testing for syphilis.

But there is another angle to this subject which has not commanded as much attention as it deserves. I refer

to the possibility of technical errors being inherent in the test itself so that falsely doubtful and positive reactions may occur in the hands of skillful and experienced technicians and, indeed, in those of the author-serologist himself. As is well known, every serologic test now employed can be made so sensitive as to yield doubtful or positive reactions with the sera of normal non-syphilitic individuals. In the race for sensitivity in the detection of syphilis author-serologists may commit the error of making their tests too sensitive. For my own part, I always have been and continue to be dedicated to the principle that it is better to reduce technical sensitivity to the level of 100 per cent negative reactions with the sera of normal non-syphilitic individuals even though this inevitably means missing the serological detection of an occasional case of chronic latent syphilis. In other words, I believe that the serologic tests for syphilis should be made technically only as sensitive as is consistent with what may be termed "practical specificity" for syphilis.

Under the circumstances it is not at all easy to determine what percentage of falsely doubtful and positive reactions is due to errors in the collection of blood and the setting up of tests and that due to the tests themselves. But if it may be assumed that in the serologic surveys the tests conducted in the laboratories of author-serologists were set up exactly as they have been described, it is apparent, as shown in Table 2, that under such conditions only one of the ten tests now commonly employed has had, up to the present time, 100 per cent negative reactions in all of the nine serologic surveys with the sera of normal, presumably non-syphilitic, individuals. In this connection, however, I point with pride to the fact that in the 1943 serologic survey all of the author-serologists listed in Table 2 reported 100 per cent negative reactions with the sera of normal, presumably non-syphilitic, individuals.

TABLE 2

Doubtful and Positive Reactions Reported by Author-Serologists with the Sera of Normal Presumably Non-syphilitic Individuals in the Serologic Surveys *

Tests	Total Sera Tested	Doubtful and Positive Reactions	
		No. Sera	Per cent
Eagle Wassermann	850	5	0.6
Eagle macroflocc.	907	13	1.4
Eagle microflocc.	580	11	1.9
Hinton regular	956	5	0.5
Kahn presumptive	967	3	0.3
Kahn standard	1,116	2	0.2
Kline diagnostic	1,116	4	0.4
Kline exclusion	802	8	1.0
Kolmer	1,116	0	0.0
Mazzini slide flocc.	429	1	0.2

* 1935, 1936, 1937, 1938, 1939, 1941, 1942, 1943, and Washington serology conference of 1941

In Tables 3 and 4 it is shown that technical errors alone, apart from those inherent in various complement-fixation and flocculation tests themselves, have apparently occurred in seven of the serologic surveys in a disturbingly large number of state laboratories. Thanks to the excellent efforts of the Committee on the Evaluation of the Serodiagnostic Tests for Syphilis, however, the situation in the last survey (1943) was greatly improved over that of the first, conducted in 1936. For example, in 1935, 50 per cent of state laboratories reported falsely doubtful and positive reactions with various complement-fixation tests, but only 13.4 per cent in 1943 (Table 3). Furthermore, the percentage of these reactions has dropped from between 1.0 and 10.0 per cent in 1936, to between 0.7 and 0.8 per cent in 1943. Somewhat less but nevertheless definite improvement has been observed also in the case of the various flocculation tests (Table 4). Thus, while 67.9 per cent of laboratories reported falsely doubtful and positive reactions in 1936, only 29.7 per cent reported them in 1943. And while the incidence of these reactions varied from 1.0 to 40.0 per cent in 1936, it

TABLE 3

Negative, Doubtful and Positive Complement-fixation Reactions Conducted by Various Methods Reported by State Laboratories with the Sera of Normal Presumably Non-syphilitic Individuals in the Serologic Surveys

Year	Total Labs.	100 Per cent Negative Reactions		Doubtful and Positive Reactions		
		No. Labs.	Per cent Labs.	No. Labs.	Per cent Labs.	Per cent Reactions
1936	22	11	50	11	50	1.0 to 10.0
1937	35	22	63	13	37	0.5 to 8.9
1938	33	23	70	10	30	1.0 to 10.0
1939	26	15	60	11	40	0.9 to 6.0
1941	31	23	74.2	8	25.8	0.8 to 1.5
1942	28	20	71.4	8	28.6	0.8 to 0.9
1943	30	26	86.6	4	13.4	0.7 to 0.8

TABLE 4

Negative, Doubtful and Positive Flocculation Reactions Conducted by Various Methods Reported by State Laboratories with the Sera of Normal Presumably Non-syphilitic Individuals in the Serologic Surveys

Year	Total Labs.	100 Per cent Negative Reactions		Doubtful and Positive Reactions		
		No. Labs.	Per cent Labs.	No. Labs.	Per cent Labs.	Per cent Reactions
1936	28	9	32.1	19	67.9	1.0 to 40.0
1937	39	17	43.3	22	56.7	1.0 to 25.0
1938	62	39	62.9	23	37.1	1.0 to 15.0
1939	51	19	37.3	32	62.7	0.9 to 14.8
1941	56	32	57.1	24	42.9	0.7 to 4.6
1942	72	41	57.0	31	43.0	0.8 to 16.3
1943	74	52	70.3	22	29.7	0.8 to 16.8

dropped to between 0.8 and 16.8 per cent in 1943.

Under the circumstances it is apparent that there is still much room for improvement on the part of some state laboratories if it is assumed that the performance of tests in the laboratories of the author-serologists (Table 2) is acceptable as a measure of the incidence of falsely doubtful and positive reactions with the sera of normal, presumably non-syphilitic, individuals. Fortunately, many state laboratories are conducting serologic surveys themselves as a check on the performance of municipal, hospital, and private laboratories within their confines. I have not sufficient data bearing upon the results observed, but I hazard the opinion that not a few are below the performance of the state laboratories themselves although these intrastate surveys are gradually and progressively improving the situation in a manner analogous to the annual interstate surveys conducted by the Committee on the Evaluation of the Serodiagnostic Tests for Syphilis.

BIOLOGICAL FALSELY DOUBTFUL AND POSITIVE REACTIONS IN NORMAL NON-SYPHILITIC INDIVIDUALS

Biological falsely doubtful and positive reactions are so designated because they are due to the presence of a reagin-like or other substance in the serum (shortly to be discussed), and therefore likely to occur in tests correctly conducted with skill and experience. That this substance may occur in the sera of normal non-syphilitic individuals cannot be denied but the true incidence is still unknown. In 1941 Eagle [1] estimated that with present-day serologic tests the incidence among university students was about 1 for every 4,000 persons tested, and perhaps even less. Mohr and his

colleagues [2] have recently reported 9 normal persons yielding these biologic nonspecific positive reactions.

As previously stated, falsely doubtful and positive reactions with the sera of normal persons may be and doubtless are due in the great majority of instances to technical factors incident to the conduct of the tests or inherent in them. For this reason it is not at all easy to differentiate between those falsely doubtful and positive reactions due to technical factors and those due to the biological factor. In so far as practising physicians are concerned, however, the important matter is the incidence of falsely doubtful and positive reactions due to a summation of these causes. In the 1943 serologic survey about 131 sera were supplied by the committee from normal, presumably non-syphilitic, donors. As previously stated, all of the author-serologists listed in Table 5 reported negative reactions. The same was true of many of the state laboratories participating in the survey but, on the other hand, a few of the latter reported all the way from one doubtful or positive reaction per 100 individuals to as high as one per 6 in the case of a supersensitive flocculation test. I mention these facts because the performance of state laboratories is probably acceptable as a broad and general index of that of laboratories in general. Undoubtedly the great majority and probably all of these falsely doubtful and positive reactions in such a small series of sera were due to technical factors, but the results are sufficient for indicating what physicians may be warned to expect with the serologic tests now commonly employed under what may be regarded as average conditions.

Much less can be stated in regard to falsely doubtful and positive reactions with the cerebrospinal fluids of non-syphilitic individuals. For various reasons it has not been possible for the Committee on the Evaluation of Serodiagnostic Tests for Syphilis to supply them for the annual interstate serologic surveys. In so far as tests conducted by author-serologists themselves are concerned, however, data are available from the 1935 survey and the Washington serology conference held in 1941. These, as summarized in Table 6, indicate that cerebrospinal fluids are much less likely than sera to yield these reactions. Undoubtedly this is due in large part to technical conditions but, on the other hand, it is quite likely that the reagin-like substance that may occur in the sera of normal non-syphilitic individuals yielding falsely doubtful and positive reactions does not occur in the cerebrospinal fluids of normal individuals. At least it is well known that natural antibodies occurring in the sera of normal individuals do not occur in

TABLE 5

Falsely Doubtful and Positive Reactions with Sera Reported by State Laboratories in the 1943 Serologic Survey

Tests	*No. Labs*	*No. Reporting Doubtful Reactions*	*No. Reporting Positive Reactions*	*Per cent Doubtful and Positive Reactions*
Eagle Wassermann	3	0	0	0.0
Eagle macroflocc.	2	1	0	0.8
Eagle microflocc.	2	0	1	0.8
Hinton regular	7	2	3	0.8– 3.2
Kahn presumptive	3	0	1	1.5
Kahn standard	32	3	1	0.8
Kline diagnostic	15	4	4	0.8– 3.1
Kline exclusion	4	2	3	3.1–16.8
Kolmer	18	2	0	0.8– 1.6
Mazzini flocc.	3	1	1	0.8

their cerebrospinal fluids, to which further reference will be made in relation to antibody for spirochetes in normal and syphilitic individuals.

TABLE 6

Falsely Doubtful and Positive Reactions with Cerebrospinal Fluids *

Tests	Total Tested	Doubtful and Positive Reactions	
		No.	Per cent
Eagle Wassermann	106	0	0.0
Eagle macroflocc.	110	0	0.0
Davies-Hinton flocc.	107	0	0.0
Kahn presumptive	107	0	0.0
Kahn standard	217	3	1.3
Kline diagnostic	122	1	0.8
Kolmer	214	0	0.0
Mazzini flocc.	106	0	0.0

* Based on the 1935 serologic survey and the 1941 Washington serology conference

BIOLOGICAL FALSELY DOUBTFUL AND POSITIVE REACTIONS IN DISEASE AND OTHER CONDITIONS

As previously stated, falsely doubtful and positive reactions with the various serum tests for syphilis have been reported from time to time in a very large number of various diseases and conditions. No useful purpose is served by reviewing the very extensive literature on the subject and particularly the early literature. But even in the case of present-day methods it is difficult to draw hard and fast deductions, largely because of the practical certainty that many of the nonspecific reactions reported have been due to technical factors. Furthermore, with the possible exception of leprosy, it is more or less characteristic of the diseases yielding biologic nonspecific reactions that the true incidence of falsely doubtful or positive reactions may not be elicited by single examinations, especially since they tend to be evanescent and disappear within relatively short periods of time following recovery.

But that falsely doubtful and positive reactions may be due to the presence in sera of a reagin-like or other substance in some diseases, and particularly those due to infections, is now well proved. In Table 7, I have divided these into three groups including a large number in which the evidence is not by any means conclusive at the present time. In this connection it would appear, however, that yaws and pinta may be excluded from the category of biological nonspecific reactions, as the phrase is ordinarily interpreted, because both diseases are due to treponemas either so closely related to *Trepanema pallidum*

TABLE 7

Diseases and Conditions Known or Suspected of Causing Biological Falsely Doubtful and Doubtful Reactions

Group A *Variable Incidence*	*Group B* *Incidence Unknown*	*Group C* *Evidence Not Conclusive*
Yaws	Febrile diseases	Rheumatic fever
Pinta	Upper respiratory tract infections	Glanders
Leprosy	Active tuberculosis	Chancroid (buboes)
Malaria	Septicemia	Vincent's infections
Vaccinia and vaccinoid	Subacute bacterial endocarditis	Rocky Mt. spotted fever
Infectious mononucleosis	Ac. lupus erythem.	Lymphopath. venereum
Virus pneumonia	Relapsing fever	Leishmaniasis
	Rat bite fever	Leukemia
	Weil's disease	Pellagra
	Typhus fever	Psoriasis
	Trypanosomiasis	Coronary thrombosis
		Diabetes mellitus
		Eclampsia
		Lead poisoning
		Acute alcoholism
		Ether anesthesia
		Sulfonamide therapy
		Serum therapy

or, indeed, the latter itself as so stoutly maintained by some investigators in so far as yaws is concerned. The literature on pinta has been thoroughly reviewed recently by Stokes, Beerman, and Ingraham.[3]

per cent, of a group of 65 cases of vaccinia showed falsely doubtful or positive serological reactions as well as 10, or 30 per cent, of a group of 45 cases of vaccinoid. In the majority of instances these reactions were observed

TABLE 8

Falsely Doubtful and Positive Reactions Occurring in Presumably Non-syphilitic Individuals with Various Diseases and Conditions *

	Leprosy (4), (5)		*Malaria (4), (5)*		*Vaccinia (7), (8)*		*Tuberculosis (4), (5), (6)*		*Febrile Dis. (4), (5)*	
Tests	*No.*	*Per cent*	*No.*	*Per cent*	*No.*	*Per cent*	*No.*	*Per cent*	*No.*	*Per cent*
Eagle Wass.	59	45.7	12	25.0	...		59	0.0	46	0.0
Eagle flocc.	110	68.2	45	22.2	...		562	0.7	90	1.1
Hinton	60	28.3	48	16.7	263	11.8	562	2.5	89	4.5
Kahn stand.	107	63.5	47	30.0	202	8.9	561	0.5	92	0.0
Kline (diag.)	110	61.8	47	21.3	263	5.3	110	0.9	90	0.0
Kolmer	109	63.3	47	29.8	465	3.9	560	0.16	91	2.2
Mazzini flocc.	58	38.0	12	50.0	465	12.3	59	0.0	46	0.0

* Single examinations

As shown in Table 8, the incidence of doubtful and positive reactions in leprosy as based upon single examinations by author-serologists in the 1935 and 1941 Washington serology surveys, has varied from 38 to 68.2 per cent while the incidence in malaria has varied from 21.3 to 50 per cent. In malaria, however, Kitchen, Webb, and Kupper [19] have reported that serially repeated tests show that 90 to 100 per cent of patients at some time in the course of the disease give biologic falsely positive Wassermann and Kahn reactions.

Since Barnard [20] first reported biologic falsely positive reactions occurring in an individual with vaccinia, the series of cases reported by Lynch and his colleagues [7] and Favorite [8] have together shown an incidence of doubtful and positive reactions varying from 3.9 to 12.3 per cent (Table 8) with the probability that the incidence is higher in flocculation than in complement-fixation tests. In this connection Major Charles R. Rein, Chief of the Division of Serology of the Army Medical School, informs me [21] that 26, or 60

during the second week following vaccination and, with one exception, disappeared within 3 months. Of 28 additional individuals developing immediate or immunity reactions, only 2 showed doubtful or positive reactions. Incidentally, Major Rein also states that very few, if any, soldiers, showed doubtful or positive reactions ascribable to vaccination against tetanus or typhoid fever.

Curiously enough, however, while it is definitely proved that vaccinia and vaccinoid may produce temporary falsely doubtful or positive reactions in human beings, this may not occur in experimental vaccinia of rabbits. At least Miss Rule and I have observed negative Kahn, Kline, and Kolmer reactions in all of a small group comprising 12 normal rabbits with vaccinia in tests conducted 4 days, 1, 2, 3, and 4 weeks after the development of vaccinal lesions of the abdominal skin. All of the animals were selected on the basis of two preliminary negative Kahn, Kline, and Kolmer reactions before inoculation with highly virulent virus, all of the Kolmer tests being conducted

by the modification of my test [22] for avoiding the nonspecific reactions shown by a large percentage of normal rabbits.

It would also appear that pulmonary tuberculosis, especially active febrile cases (Table 8), may show a very low incidence of falsely doubtful or positive reactions [4, 5, 6] as may likewise be true of other febrile diseases [4, 5] and especially the acute exanthemata. Here again, however, Miss Rule and I have observed no confirmatory evidence in our experiments with a small number of rabbits. For example, 12 normal animals were selected on the basis of two preliminary negative Kahn, Kline, and Kolmer reactions. Four were inoculated intradermally (abdominal) with a virulent broth culture of Type I pneumococcus, 4 with a virulent culture of group A hemolytic streptococcus, and 4 with a virulent culture of *Staphylococcus aureus*. Within 48 hours all developed large lesions and fever, 4 succumbing with septicemia (positive heart blood cultures) in 3 to 7 days after inoculation. Kahn, Kline, and Kolmer tests conducted with the sera of surviving animals 4 days, 1, 2, 3, and 4 weeks after inoculation gave consistently negative reactions in all.

However, special mention should be made of falsely doubtful and positive reactions occurring in atypical pneumonias, and especially those due to viruses. Major Rein states [21] that 10 cases in 50 have shown them after the 12th day of the disease, the majority disappearing or reacting negatively in 2 to 6 months.

In afebrile diseases, obstructive jaundice, malignant tumors, menstruation and pregnancy, however, the incidence of falsely doubtful and positive reactions (Table 9) is apparently so nearly the same as may be expected from technical factors that I believe it may be properly stated that these diseases and conditions do not yield biologic nonspecific reactions.

TABLE 9

Falsely Doubtful and Positive Reactions Occurring in Presumably Non-syphilitic Individuals with Various Diseases and Conditions *

	Afebrile Dis.† *(5)*		*Jaundice (4)*		*Tumors* ‡ *(4), (5)*		*Menstruation (4)*		*Pregnancy (4)*	
Tests	*No.*	*Per cent*	*No.*	*Per cent*	*No.*	*Per cent*	*No.*	*Per cent*	*No.*	*Per cent*
Eagle Wass.	131	0.0	..	...	48	0.0	..	...	..	...
Eagle flocc.	131	1.5	49	0	109	0.9	25	0.0	54	0.0
Hinton	131	0.0	51	5.9	110	4.5	24	4.2	53	5.7
Kahn (stand.)	131	0.0	51	1.9	111	0.0	25	0.0	54	0.0
Kline (diag.)	131	0.0	51	0.0	111	0.0	25	0.0	54	0.0
Kolmer	129	0.8	50	2.0	111	0.9	25	0.0	54	0.0
Mazzini flocc.	131	1.5	..	...	49	0.0	..	...	..	...

* Single examinations

† Convalescent pneumonia, diseases of gastrointestinal tract, diabetes, cardiovascular disease, postoperative convalescence and fractures

‡ Malignant neoplastic disease

Unfortunately infectious mononucleosis has not been subjected to study in the serologic surveys. Furthermore, the literature is quite contradictory and confusing and fails to indicate the true incidence of falsely doubtful and positive reactions in this disease because it is based so largely upon single examinations. Thus, as shown in Table 10, the incidence of reactions reported by various investigators has varied all the way from none to 100 per cent, with an average of 7.3 per cent doubtful or positive complement-fixation reactions in 202 cases and 9.6 per cent doubtful or positive flocculation reactions in 157 cases.

TABLE 10

Doubtful and Positive Reactions Reported in Infectious Mononucleosis *

Authors	Complement-fixation		Flocculation	
	No. Cases	*No. Doubtful or Positive*	*No. Cases*	*No. Doubtful or Positive*
Parkes-Weber [9]	..	..	3	1
Parkes-Weber and Bode [10]	3	3	3	2
Gooding [11]	27	16	..	..
Butt and Foord [12]	18	0	..	..
Bernstein [13]	37	6	37	4
Fowler and Tidrick [14]	3	2	3	1
Kauffman [15]	82	3	82	1
Mills and Jahn [16]	9	0	9	0
Werlin, *et al.*[17]	4	4	4	4
Kolmer, *et al* [18]	19	1	16	2
Totals	202	35 (7.3%)	157	15 (9.6%)

* Mostly single examinations

SEROLOGIC INDICES

While it is not my purpose to discuss at length the present-day serologic tests from the standpoint of sensitivity in the serum diagnosis of syphilis, the subject may be referred to briefly. In Table 11 has been summarized the doubtful and positive reactions reported by author-serologists in the nine serologic surveys, including the Washington serology conference, as indicative of what may be expected under optimum conditions with the tests listed. It will be observed that the incidence for all cases of syphilis, treated and untreated, has varied from 77.6 to 90.9 per cent. But in evaluating the various tests due consideration must be given the incidence of falsely doubtful and positive reactions. I have sought to do this in each test by subtracting from the percentage of reactions observed in syphilis (Table 11) the percentage observed in presumably normal non-syphilitic individuals (Table 2) multiplied by 10, as suggested by Herman Brown. The results are what I have termed the "serologic indices" shown in Table 11. On this basis the present-day serologic tests listed in the table show indices varying from 66.5 to 84.5 per cent. Needless to state, it is not reasonable to expect that any serologic test can be made sufficiently sensitive to yield positive reactions in all cases of syphilis under conditions whereby the incidence of falsely doubtful and positive reactions are kept at their present very low

TABLE 11

Doubtful and Positive Reactions Reported by Author-Serologists with the Sera of Syphilitic Individuals in the Serologic Surveys *

Tests	*Total Sera Tested*	*Doubtful and Positive*		*Serologic Indices*
		No. Sera	*Per cent*	
Eagle Wassermann	1,678	1,302	77.6	77.6 — (0.6 × 10) = 71.6
Eagle macroflocc.	1,880	1,544	82.1	82.1 — (1.4 × 10) = 68.1
Eagle microflocc.	1,104	944	85.5	85.5 — (1.9 × 10) = 66.5
Hinton regular	2,281	1,941	85.1	85.1 — (0.5 × 10) = 80.1
Kahn presumpt.	1,855	1,559	84.0	84.0 — (0.3 × 10) = 81.0
Kahn stand.	2,083	1,647	79.1	79.1 — (0.2 × 10) = 77.1
Kline diag.	2,295	1,860	81.0	81.0 — (0.4 × 10) = 77.0
Kline exclusive	1,489	1,353	90.9	90.9 — (1.0 × 10) = 80.9
Kolmer	2,276	1,790	78.6	78.6 — (0.0 × 10) = 78.6
Mazzini flocc.	835	722	86.5	86.5 — (0.2 × 10) = 84.5

* 1935–1943 including the Washington serology conference

and gratifying levels. For example, time is required for the production of reagin in primary syphilis, and its production in chronic latent syphilis may be so slight as to escape serological detection. Undoubtedly, however, further serologic research will improve sensitivity, especially in the way of producing superior antigens, but this is only to be welcomed in case the incidence of nonspecific reactions due to *technic* is kept at or very near zero. It may be, however, that any material increase in sensitivity for syphilis will also increase the incidence of biologic nonspecific reactions in normal individuals and those with non-syphilitic diseases.

SPIROCHETAL COMPLEMENT-FIXATION TEST

While the pioneer investigations on complement-fixation in syphilis employing antigens prepared of cultures of alleged *Treponema pallidum* were conducted in this country about thirty years ago by Noguchi,[23] Craig and Nichols[24] and Kolmer, Williams, and Laubaugh,[25] the subject never attracted much attention until 1929 when Gaehtens and Otto[26] greatly renewed interest in it by reporting that a phenolized saline suspension of cultures of the Reiter strain of alleged *T. pallidum* as antigen, commercially available in Germany under the name of "Palligen" yielded specific complement-fixation reactions in syphilis which were apparently separate and independent of the Wassermann and flocculation reactions as well as more sensitive than the latter, especially in treated syphilis. I have elsewhere summarized the literature on the subject,[27] but here it may be stated that of a total of 13,636 tests conducted with "palligen" and the sera of syphilitic individuals, the incidence of positive reactions has varied from 44.5 to 100 per cent, with an incidence of positive Wassermann reactions varying from 30.4 to 100 per cent. In a total of 36,255 tests conducted with "palligen" and the sera of presumably non-syphilitic individuals the incidence of falsely positive reactions has varied from 0 to 3.4 per cent, with an incidence of 0 to 2.7 per cent in the case of the Wassermann reaction.

In the Washington serology conference[5] complement-fixation tests were conducted by Dr. Eagle with a spirochetal antigen prepared of cultures of the Reiter strain. Carola E. Richter of the Pennsylvania State Department of Health Laboratories, who kindly substituted for me at the conference, also conducted the Kolmer complement-fixation test with an antigen prepared of cultures of the same strain by Clara Kast. The results observed with both tests, as well as in duplicate tests employing the Eagle and Kolmer tissue or lipoidal antigens, are summarized in Table 12.

It will be observed that the two spirochetal complement-fixation tests yielded from 0.6 to 2.9 per cent falsely doubtful and positive reactions with the sera of normal individuals. In the Kolmer tests this percentage was not as high as previously reported[28] because the antigen was used in a smaller amount, but Kolmer and his colleagues[27 28] have ascribed them to the presence of natural spirochetal antibody in human sera which is apparently of a group character, as similar reactions have been observed with antigens prepared of cultures of *T. microdentium* and *T. macrodentium*.[28] As expected, no falsely doubtful or positive reactions were observed with either test in the examination of cerebrospinal fluids from 107 presumably normal individuals and non-syphilitic individuals afflicted with neurologic or mental diseases, because natural antibodies do not ordinarily occur in normal spinal fluids. But it is evident, as shown in Table 12, that this spirochetal antibody is increased not only in syphilitic but in non-syphilitic

TABLE 12

Percentages of Doubtful and Positive Reactions in Complement-Fixation Tests Employing Tissue and Spirochetal Antigens *

Clinical Status	Total Sera Tested	Eagle Tests		Kolmer Tests	
		Tissue Antigen	Spiro. Antigen	Tissue Antigen	Spiro. Antigen
Normal individuals	169	0.0	0.6	0.0	2.9
Afebrile diseases or conditions	130	0.0	2.3	0.8	6.2
Intercurrent febrile diseases	46	0.0	4.4	2.2	10.9
Tuberculosis (any type)	59	0.0	3.4	0.0	6.6
Malignant disease	49	0.0	8.1	0.0	20.4
Leprosy in any stage	60	45.7	24.1	61.0	28.8
Malaria (febrile and afebrile)	12	25.0	25.0	54.5	27.3
Early syphilis (prim. and sec.)	45	84.1	88.8	91.1	84.4
Syphilis, less than 4 yrs.	119	49.5	61.3	60.5	59.6
Syphilis, over 4 yrs.	212	68.3	90.0	80.0	80.5

* Based upon the results reported at the Washington serology conference

individuals as well with febrile and afebrile intercurrent diseases, tuberculosis, malignant disease, leprosy, and malaria. Under the circumstances it is also evident that the spirochetal complement-fixation test is of no value in differentiating between true and falsely doubtful and positive reactions in so far as serum tests are concerned. It may be otherwise, however, in the case of tests employing cerebrospinal fluid, not only because falsely doubtful and positive reactions apparently do not occur in normal individuals in tests employing spirochetal antigens, but because both Eagle and Kolmer reported about 85 per cent doubtful and positive reactions in 127 treated and untreated cases of syphilis of the central nervous system. Under the circumstances a positive spirochetal complement-fixation reaction with spinal fluid in a doubtful case of syphilis may be of value in establishing the presence of the disease, although a negative reaction is of no value in excluding the possibility of its presence. In this connection it is also to be stated that Kolmer, Kast, and Lynch [29] found that antigens prepared of virulent *T. pallidum* (Nichols-Hough strain) obtained from acute testicular sypilomas of rabbits, were more sensitive and specific than antigens prepared of cultures of alleged *T. pallidum,* but owing to technical difficulties in their preparation they probably cannot be employed.

Undoubtedly, therefore, antibody for *T. pallidum* is produced in syphilis and presumably likewise in yaws and pinta. This is based not only upon complement-fixation but upon agglutination tests as well in so far as syphilis is concerned.[29] Why an increase of spirochetal complement-fixing antibody occurs in leprosy, malaria, tuberculosis, and other diseases listed in Table 11 is difficult to state. It may be assumed that the plasmodia of malaria and the bacillus of leprosy share with *T. pallidum* a common antigenic substance responsible for its production. But unless or until proved otherwise, I prefer to assume that in these non-syphilitic diseases it is due to increase of the natural group spirochetal antibody in the nature of an anamnestic reaction.

MECHANISM OF FALSELY DOUBTFUL AND POSITIVE REACTIONS

Little of a definite nature is known of the mechanism of complement-fixation and flocculation reactions in syphilis employing alcoholic extracts of beef heart or other mammalian tissues as antigens. This is very unfortunate because precise knowledge is so important in relation to the solution of the problem of falsely doubtful and positive

reactions. I believe it may be stated, however, that the mechanism is fundamentally the same in each procedure. At least it appears that both are due to the presence in serum and spinal fluid of a substance capable of flocculating the alcohol-soluble tissue lipoids in colloidal suspension. In complement-fixation tests these flocculi cannot be seen with the naked eye, but are capable of absorbing or fixing complement. But under proper technical conditions the flocculi can be rendered grossly visible, as in the macroscopic flocculation tests, or, microscopically visible by ordinary examinations, as in the microscopic flocculation tests.

The important question concerns the nature of this flocculating substance. This applies not only to syphilitic human beings but also to normal persons and non-syphilitic individuals with other diseases; also to normal rabbits, cattle, horses, mules, chickens, and other lower animals which are well known to yield biological falsely doubtful and positive complement-fixation and flocculation reactions. It is commonly regarded as an antibody or antibody-like substance known as reagin.

In the light of our present knowledge, however. it seems to me that this substance is not an antibody and quite separate and apart from the spirochetal antibody previously discussed. Rather it appears that it may be a modified serum globulin which may not be detected by ordinary chemical methods, although Cardon and his colleagues [34] have suggested recently that hyperproteinemia, and especially hyperglobulinemia, may be in relation to the mechanism of biologic nonspecific reactions. At least various investigators [31–34] have shown that practically all sera of normal persons contain a substance capable of flocculating tissue lipoids under suitable technical conditions. Under the circumstances it appears that the difference between non-syphilitic and syphilitic sera is one of degree rather than of kind—quantitative rather than qualitative.[31] In syphilis, yaws, and pinta it may be that the reacting substance is only an increase of this factor, although I believe that it may be a globulin or a modified globulin which, as previously stated, may not always be detected by the usual chemical methods now employed. If this is true, one may readily understand that an increase of a normal globulin or its modification may account for positive complement-fixation and flocculation reactions not only in syphilis, yaws, and pinta, but in an occasional normal person as well as in non-syphilitic individuals with leprosy, malaria, vaccinia, infectious mononucleosis, virus pneumonia, etc.

I have elsewhere discussed this subject with more detail [27] but here it may be stated that the preponderance of evidence at the present time is in favor of regarding the reagin as separate and distinct from the spirochetal antibody. Gaehtgens [35] as well as Kroó, Schultze, and Zander [36] have expressed this opinion while Beck,[37] Kolmer, Kast, and Lynch [38] have come to this conclusion largely on the basis of absorption tests with syphilitic sera with tissue lipoids for the removal of the reagin and with spirochetes for the removal of the spirochetal antibody. Eagle and Hogan,[39] however, have stated on the basis of their absorption experiments, that the lipodotropic reagin and spirochetal antibody are identical, or, in other words, that positive complement-fixation and flocculation reactions with tissue antigens as well as positive spirochetal complement-fixation reactions are due to spirochetal antibodies.

Be this as it may, the important practical question is whether or not the reagin responsible for biological nonspecific reactions with the sera of human beings and the lower animals is different in its properties from the reagin

responsible for complement-fixation and flocculation reactions in syphilis, yaws, and pinta. Kahn [40] believes that the former is most active in flocculation tests conducted at a cold temperature (1° C.) and when the salt concentration of the reacting system is reduced to a minimum, while the latter is most active at body temperature. On this basis he has devised various "verification tests" for differentiating between biological nonspecific and specific reactions to which further reference will be made. Here it may be stated, however, that in the Kolmer complement-fixation test, at least, there can be no doubt of the fact that the reagin produces much more complement-fixation at a cold temperature of 4 to 8° C. over a period of 15 to 18 hours than in a water bath at 38° C. for 1 hour, regardless of whether it is occurring in the normal sera of human beings or the lower animals, in the sera of non-syphilitic human beings with various diseases and conditions, or in the sera of syphilitic human beings. In other words, differentiation between biological nonspecific and specific reactions has not been found possible on the basis of the temperature employed in conducting the tests in so far as complement-fixation is concerned.

Personally, however, I am not without hope that a solution of the problem will be found by changing the methods employed in the preparation of tissue antigens. Investigations now being conducted by Herman Brown and the writer indicate that it may be possible to remove certain lipoids with which the nonspecific reagin reacts without reducing the sensitivity of the antigen in relation to the syphilis reagin. Furthermore, if it is found possible to prepare antigens which are satisfactory for the serodiagnosis of syphilis without the addition of a sensitizing sterol, like cholesterol, an additional step toward a solution of the problem will have been accomplished, and I am not without hope that this is possible.

MANAGEMENT OF FALSELY DOUBTFUL AND POSITIVE REACTIONS

While these matters are being ironed out by present and future serological investigations, however, the management of falsely doubtful and positive reactions occurring under present conditions constitutes a practical problem of first rate importance in order to reduce to a minimum the regrettable error of the needless treatment for syphilis. To this end the close coöperation of clinicians and serologists is required. Even though the incidence of nonspecific reactions due to technic is very low, when present-day approved tests are correctly conducted, and even though false reactions with the sera of normal, presumably non-syphilitic, individuals may occur only once in anywhere from 1,000 to 4,000 examinations, yet all figures and statistics are of little avail in so far as the individual involved is concerned.

As summarized in Table 13, certain clinical procedures are indicated. It is a mistake for the physician to place the whole burden on the laboratory. Certainly no director of a laboratory, serologist or technician who is completely ignorant of the clinical status of the individual and the conditions surrounding the collection, labelling, and delivery of the specimen, can make so important a decision as to whether syphilis is or is not present, whether treatment should or should not be given or, in the case of the latter, the kind and duration of treatment to be administered. In other words, the serologic tests alone are insufficient and do not constitute a short-cut or royal road in differentiation between true and false doubtful and positive reactions. As a matter of fact, the difficulty in the interpretation and management of presumably nonspecific reactions is in

TABLE 13

Clinical Procedures in the Interpretation and Management of Presumably Falsely Doubtful and Positive Reactions

1. Collect and deliver specimens with due care against bacterial and chemical contamination to avoid technical nonspecific reactions (see Table 1).
2. A negative history for syphilis is of little or no value in excluding the possible presence of the disease.
3. Make thorough examinations for acquired and congenital syphilis.
4. Take careful history and make necessary examinations if and when necessary for the diseases and conditions capable of yielding biological nonspecific reactions (see Table 7).
5. Examine spinal fluid in selected cases. Positive results are indicative of syphilis. Negative results do not exclude its possible presence.
6. Provocative treatment may be tried in some cases but negative serologic results do not exclude the possibility of syphilis.

relation to the clinical skill and experience of the physician in chronic acquired and especially late congenital syphilis. There is no substitute for thorough clinical examinations so skillfully indicated and outlined by Stokes and Ingraham [41] and by Moore and his colleagues.[42]

On the other hand, however, serologists and technicians cannot escape participation and a heavy responsibility in the elucidation of the problem in individual cases as I have attempted to summarize in Table 14. Certainly there is no one best test for syphilis. Serological diagnosis is always best served by using two or more approved methods routinely of which, in my opinion, one at least should be a complement-fixation procedure. Needless to state, this is not always possible when very large numbers of tests are to be conducted, as in state and other laboratories. Under such conditions a screen test of acceptable sensitivity and specificity is required, of which my preference is for one of the microflocculation procedures. But I believe that all positive reactions should be checked by another method before a report is rendered. Under these conditions it is inevitable that a screen test may occasionally give a falsely negative reaction, but unless conditions permit the routine use of two or more methods it is about the best that a hard worked laboratory can do. In my own laboratory all sera are tested routinely by a complement fixation, a macroflocculation and a microflocculation procedure.

As previously stated, physicians should never jump to the conclusion that syphilis is present on the basis of a single doubtful or positive reaction unless there is supporting historical or clinical evidence. But, on the other hand, they should not be ignored simply because clinically unsuspected. When such reactions are suspected of

TABLE 14

Serological Procedures in the Interpretation and Management of Presumably Falsely Doubtful and Positive Reactions

1. Conduct the test or tests with care and skill exactly as described by author-serologists to avoid technical nonspecific reactions as much as possible (see Table 1).
2. Conduct the tests by several methods in the same or different laboratories.
3. Spirochetal complement-fixation reactions with *sera* are of no value but positive reactions with *spinal fluids* are indicative of syphilis; negative reactions do not exclude its possible presence.
4. The value of verification tests is uncertain but they are worthy of trial.
5. Withhold judgment and treatment but repeat the tests at intervals over a period of at least 3 to 6 months. If negative reactions occur syphilis is usually to be excluded; if positive reactions persist syphilis is probably present and treatment is advisable.

being nonspecific, judgment and treatment should be withheld for at least 3 to 6 months, with a repetition of the tests every 2 to 4 weeks. If, during that time, the reactions have become repeatedly negative and there are no historical or clinical evidences of syphilis, it would appear that the disease may be excluded. However, if persistently positive reactions are observed with approved methods properly conducted, even though but weakly positive, I see no escape from the advisability of making a tentative diagnosis of syphilis and instituting treatment in the best interests of the individual involved.

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Discussion

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THE concluding paragraph of Dr. Kolmer's paper conveys a thought which may well deserve further emphasis, especially in regard to the transposition of test findings into terms of clinical syphilis. Almost from the time of the development of the Wassermann test a positive finding has been accorded a diagnostic weight amounting almost to infallibility. As the newer tests were developed and came into use they were permitted to share in this position of reliability. As the use of the tests became more general and as the multiple testing of individual sera was practised, the vagaries and discrepancies of test findings became apparent in treated syphilis as well as in conditions without syphilis as a causative factor.

At the present time, and assuming that the methods which are available are carried out in an acceptable manner, the advisability of exercising a careful scrutiny of all factors involved, before permitting the diagnosis of syphilis to be based entirely upon serologic findings, is accepted. This is important especially when clinical and historical confirmations are lacking. The waiting period, referred to by Dr. Kolmer, during which the diagnosis is withheld although positive test findings may have been recorded, serves as a safeguard in instances in which such conditions as infectious mononucleosis, virus pneumonia, vaccinia, or any of a host of other intercurrent factors may be responsible for the positivity expressed by one or a group of well conducted tests. A time interval of several months before making an arbitrary diagnosis is sometimes sufficient for the reacting substance to disappear entirely from the blood serum or to have been reduced in concentration to a point that the decline in strength of the reaction is obvious.

The use of the waiting period is of limited helpfulness in instances of false positive or discrepant findings occurring in pregnancy. Here it becomes necessary to take into account the risk of an unfavorable outcome as regards the child. This consideration sometimes dictates that the patient be placed under treatment without appreciable delay and without too much regard for the refinements of diagnosis. An attempt to establish the true syphilis status of the mother should be made after delivery although the interposition of treatment always complicates the diagnostic problem.

It is felt that the practice of reporting test results as positive, doubtful, or negative makes impossible the best usefulness of serodiagnostic tests in instances of biologic false positive reactions. A positive report may be given to a reaction which is just sufficient to be so classified or it may represent a concentration of reacting substance manyfold that required to produce the minimal reaction. The authenticity of the minimal reaction may well be questioned in instances in which there is lack of confirmation by history or clinical findings. A persistent positive reaction of high titer is, in the majority of instances, the product of syphilis. The information which would permit the diagnostician to make a discrimination of this kind is lost through the practice of withholding the numerical reading of the degree of positivity.

Hard of Hearing Appointments

The American Society for the Hard of Hearing, Washington, has announced the appointment of Raymond H. Greenman, as Managing Director of the Society. Mr. Greenman succeeds Betty C. Wright, who is on leave to serve with the American Red Cross as consultant in Army hospitals for the care of deafened soldiers. Miss Wright will return to the Society. as Director of Field Service. Mr. Greenman leaves a war assignment with the American Social Hygiene Association and was formerly Executive Secretary of the Tuberculosis and Health Association of Rochester and Monroe County, N. Y.

American Journal of Public Health
and THE NATION'S HEALTH

Official Monthly Publication of the American Public Health Association

Volume 34 May, 1944 Number 5

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A NEW SERUM FOR A NEW PURPOSE

OUR older public health workers will recall ancient controversies between adherents of the "humoral theory" of immunity based on the work of Pasteur and the "cellular theory" suggested by the studies of Mechnikov. This apparent conflict has disappeared, with recognition of the fact that substances present in the blood stream must obviously be produced in living cells somewhere in the body; and the work of Besredka and Kahn has emphasized the fact that protective substances are often actually highly concentrated in particular body tissues such as the skin and the peritoneum.

Almost all of our previous researches have, however, been concerned with antibodies produced in response to the stimulus of materials derived from foreign protein or protein-like substances and specifically protective against such alien substances. In other words, they have been concerned with the sort of phenomena which can be classed as manifestations of specific immunity.

Within the past few years, a group of Russian biologists have opened up an entirely new area of research, based on evidence that the injection of material from the human body itself can stimulate the reticular system to a state of higher activity, which manifests itself in enhanced power to combat disease. This is a phenomenon of increased vital resistance against various maladies, rather than a specific immunity against any single foreign protein; and is related to the activity of connective tissue—a tissue which is conceived, not as primarily a mechanical framework of the body, but as a system of primary importance in the regulation of nutrition and metabolism. We may some day say that a man is as old as his connective tissue—rather than as old as his arteries.

The procedure developed by A. A. Bogomolets and his associates at the Institute for Experimental Biology and Pathology of Kiev [1] involves the production of an "Anti-Reticular Cytotoxic Serum" by the injection of horses with the cellular material from human spleen and bone marrow; and interesting methods of titrating the resultant horse serum have been devised by complement-fixation and in other ways. The Russian experiments suggest that this serum: (a) stimulates the production of hemolysins and agglutinins and the process of phagocytosis

(in a general rather than a specific sense) and is of value in puerperal and other infections; (b) aids materially in the treatment of war wounds and other surgical conditions and of frost-bite; (c) produces definite lowering of abnormal blood pressures; (d) in animals, checks the development of malignant growths. In the latter case, and perhaps under other conditions, excessive amounts of the serum produce a definitely unfavorable effect, so that dosage is of primary importance.

All this is, in high degree, startling and revolutionary; but the evidence presented is comprehensive and highly suggestive. This may prove to be one of the most far-reaching of the many interesting discoveries which have come to us from the great institutes of scientific research of the Soviet Union.

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FLUORINE AND DENTAL CARIES

IT was nearly thirty years ago that Black and McKay demonstrated the relation of an excess of fluorine in drinking water to mottled enamel; and later researches showed that the presence of over 1.5 p.p.m. of fluorine in a public water supply was definitely associated with the presence of this particular dental condition.

In 1938, Dean, of the U. S. Public Health Service, noted that, among school children, in areas supplied with drinking water of high fluorine content and in which mottled enamel was endemic, incidence of dental caries was noticeably low. The relationship thus suggested was confirmed by chemical studies of the fluorine content of carious and non-carious teeth and by animal experimentation. It seems clear that we have, in this case, an intriguing example of the desirability of maintaining in the human body an optimal concentration of a particular chemical element—a value below this optimum tending to favor one diseased condition and a value above this optimum to cause another disease of a different type. It is possible that data with regard to fluorine content of water and food may explain in part the remarkable freedom from dental caries of certain primitive peoples and the alleged differences in this disease in first and second generation immigrants in this country.

In view of the extensive incidence of dental caries and of the baffling obscurity which has shrouded its causation, these discoveries are of primary importance; and the symposium presented on this subject was one of the highlights of the last A.P.H.A. meeting.[1]

The possibility of controlling the development of dental caries by increasing the fluorine-content of public water supplies deficient in this element is obviously suggested; and Faust and other engineers have pointed out the practicability and economy of such a procedure. It would appear from the extensive studies of the U. S. Public Health Service that a 50 per cent reduction in the incidence of dental caries could be anticipated.

The addition of fluorine to water supplies would, however, chiefly affect the population of the future, since the process is fully effective only on individuals supplied with fluorine during the first eight years of life; and it could obviously influence only those persons served by public water supplies. Bibby and Cheyne in 1942 suggested the direct topical application of fluorides to the permanent

teeth of older children. Recent studies have been made by Knutson and Armstrong of the U. S. Public Health Service group, in which the teeth in one quadrant were treated and future development of caries noted and compared with an untreated quadrant as a control. These studies have indicated an approximate 40 per cent reduction in newly developed dental caries as a result of this procedure. The treatment is not effective in checking extension of caries on an individual tooth already attacked. Bibby [2] has recently been a strong advocate of the topical application of fluoride for prevention of caries.

If both the treatment of water supplies and the topical application of fluorine to the teeth were employed, there would be ample need for all the conventional facilities in the form of dental service which we can hope to provide. Gruebbel points out that in one Missouri county the adequate treatment of carious teeth in children between 6 and 14 years of age would require four-fifths of the time of all the dentists in the county. The studies of the Committee on the Costs of Medical Care showed that in 1929—at the peak of peacetime prosperity—the individual in the lower half of the population from an economic standpoint had on the average one-tenth of a visit to a dentist per year.

If the new knowledge in regard to dental caries can be practically applied it will make a contribution to the health of the people of the first magnitude. In all new developments of science there arise unsuspected obstacles, and we should always be on guard against any attempt to exploit them prematurely. The evidence seems, however, sufficiently clear to warrant carefully controlled experiments on "fluorinization" of water in communities where the fluorine content of water is low (which must obviously be continued over a period of years [3]); and the accumulation by dentists of more extensive evidence as to the effectiveness of topical treatment.

REFERENCES
1. *A.J P H.*, 34:133–147 and 239–249 (Feb. and Mar.), 1944.
2. *J. Am. Dent. A*, 34:228–236 (Feb.), 1944.
3. As suggested by Bernard, *Pub. Health Rep.*, 58:857 (June 4), 1943.

MEDICAL CARE FOR THE WIVES AND INFANTS OF SERVICEMEN

A YEAR of experience has now been accumulated with the Emergency Maternity and Infant Care program to provide medical, nursing, and hospital care for the wives and infants of enlisted men in the four lowest pay grades of the Army, Navy, Marine Corps, and Coast Guard, which became effective March 18, 1943.

The service is provided under plans administered in each state by the state department of health. It is available as a right to all families of servicemen in the specified grades with no humiliating means test; although it is naturally assumed that the ordinary community facilities, in the form of infant welfare stations and public health nursing service, will not be duplicated, and that infants of servicemen will be accepted by such agencies without financial investigation.

There were naturally misunderstandings and conflicts of interest in the inception of this program; and, in certain states, these conflicts aroused resentment which for a time weakened the confidence of the public in its public health leaders and in the medical profession. Fortunately, these difficulties have been overcome. The program is now in operation in all 48 states, Hawaii, Alaska,

Puerto Rico, and the District of Columbia. By the end of the first year of operation, it is estimated that maternity and infancy care will have been made available to a quarter of a million wives and infants of enlisted men.

The large number of cases cared for testifies to the generous coöperation of the medical profession in this essential contribution to national morale; and the fact that applications are being currently received at the rate of more than 30,000 per month evidences the satisfaction of patients with the service provided.

Our state health departments have met a serious challenge in providing the record-keeping and accounting involved in the application of so large a program. They have learned the job now and complaints from physicians and hospitals of delayed payment are less frequent than at first. The fact that 86 per cent of all maternity cases completed in December, 1943, were delivered in hospitals is highly encouraging; and letters from certain states indicate that applications for care are coming in earlier and earlier in the period of pregnancy.

Opposition to the program has centered almost wholly on the method of payment of physicians and on certain details with regard to the rate of per diem payment to hospitals (the latter difficulties being ironed out as the system evolves).

It has been proposed, for example, that instead of recompensing the physician or the hospital for the service rendered, the patient should receive a financial allotment of some sort and pay her own bills. Such a procedure would, however, be in contravention of the clear intent of the Congress which was to provide medical care and not a cash bonus, and it would obviously preclude the maintenance of any standards of quality of service. Medical economics has its well established principles as clinical medicine has; and one of these principles is that a cash indemnity plan inevitably fails. Artemas Ward once said, "There is a great deal of human nature in man." Enough patients will use their cash for other purposes than that for which it was intended—and enough doctors will add to their charge the amount of any available cash grant—to wreck any program founded on a cast indemnity basis.

A second suggestion is that the patient, if she desires, should be permitted to pay an additional fee to the physician or hospital beyond the rate of payment under state plan. If the doors were once opened to such a procedure, each wife of a serviceman would eventually be forced into a discussion with the hospital and physician as to the amount the traffic would bear and the basic purpose of providing for essential needs without a means test would be defeated.

A third criticism concerns the primary basis of payment to the physician. Consultant services and medical care for unusual conditions not directly related to maternity are provided on a fee-for-service basis, but the routine prenatal, obstetrical, and post-partum care is paid for an a flat rate per case. This system may work hardships on an individual physician who has a few exceptionally difficult cases, but will in general balance out and is eminently desirable from the standpoint of avoiding paper work for physicians and heavy administrative costs. Recent modifications of the plan provide additional fees for certain complicating conditions.

Finally, the actual size of the flat fee has been the subject of extended discussion. The care to be provided is not a "charity" service; nor is it, on the other hand, a luxury service. It cannot be expected that average fees will be paid on a level with the charges of city obstetricians. Discontent naturally arises from the fact that a physician who may, in his ordinary practice, be com-

pletely generous and unselfish in his service to the needy, naturally thinks of the fee he charges to the wealthy as the "normal" price for such service. If the government pays less than this "normal," he feels aggrieved. Yet such a physician actually obtains a far higher total income with fully-paid-up patients at $50 a head than with a few large fees and much free service—at least, when dealing with such families as those here concerned whose heads are now receiving from $50 to $78 a month.

In spite of doubts and difficulties, the program has gone forward with notable success. In March, the Surgeons General of the Army and Navy addressed a special message of thanks to the physicians of the United States for their participation in this enterprise. "Physicians," they say, "the country over are contributing their medical skill in this wartime program generously and in return for moderate recompense. Hospitals the country over have opened their doors to these wives and their infants making available accommodations where their medical needs can be met adequately, though without luxury care. Nurses the country over are helping in the city and the rural homes and in the hospitals. . . . The morale in the armed forces is being raised and our fighting men go overseas with greater confidence in the security of their families because of this wartime program. We who are responsible for the health and medical care of the men in the armed forces are grateful to you—physicians, nurses, and hospitals—who are participating in this program of care for the wives and infants of these men. . . . Your contribution is an invaluable aid to us in the prosecution of the war."

The tribute is well deserved. Similar appreciation should also be extended to the state departments of health and certain city departments which have carried a heavy share in the burden of administering the program; and to Dr. Martha M. Eliot and her staff in the Children's Bureau who have wisely and courageously guided the course of one of the outstandingly valuable wartime efforts in the United States.

Credit Lines

COMPULSORY TREATMENT FOR TUBERCULOSIS

Dr. William P. Shepard, Welfare Division of the Metropolitan Life Insurance Company, San Francisco, has called to the attention of the Managing Editor "an amazing and educational document which deserves wider dissemination." Dr. Shepard has secured the permission of the author, Honorable Marion G. Woodward, Judge of the Superior Court No. 3 of San Joaquin County, Calif., to publish the letter.

"My purpose in calling it to your attention," writes Dr. Shepard, "is that so many health officers, some of them lacking in experience, are so inclined to resort to compulsion when persuasion and education are the indicated procedure. Persuasion and education take so much more time and effort and are not always 100 per cent successful. Nevertheless, many health officers of my acquaintance at least do not appreciate the viewpoint expressed by Judge Woodward."

December 24th, 1940.

Dear Sir:

Your letter of the 17th, informing me of the death of Miss ———— ————, a minor whom I refused to adjudge a ward of the Juvenile Court in order that she might be compelled to accept hospitalization, and taking me to task for failure to "coöperate," has been received.

It would serve no useful purpose to suggest the impropriety of your letter. The point of view behind it, however, interests me. Were it not for the fact that individual rights are being ruthlessly subordinated to the state the world over, I should be quite startled by the subtle implications of your language. But regardless of my personal reactions, the letter indicates that you have not considered the broader aspects of the problem.

First of all, I must point out that the Superior Court is not a benevolent or educational agency which may be expected to "coöperate" with community philanthropy or other worthy effort. Nor is it a Gestapo for dealing with those under-privileged members of society who have not caught up with our advanced standards and who often irritate us by their stupidity and lack of appreciation. On the other hand, the Court is a tribunal whose main function is to determine facts and declare the law applicable thereto. It is not at all concerned with the consequences of its official acts, nor has it any coöperative or other connection with the undeclared policy-making power of the State. This does not mean that judges themselves are always in personal accord with their judgments and decrees, or are unmindful of the fact that perhaps better social results could be obtained had a particular decision been different.

In the ———— case the young woman was not referred to "my court" for aid as that word is ordinarily understood. She had been living at home with her widowed mother and had violated no law. She was, therefore, neither a delinquent nor a dependent. Her home, it may be admitted, was humble and probably contained little more than the bare necessities of life; but she was happy and contented there and desired to remain, and her mother and brother wished her to do so. This being true, the petition for making her a ward of the Juvenile Court was somewhat of a subterfuge, although the broad language of the statute could have been made to fit the situation had I wished to avail myself of it.

The "aid" sought from me, in my official capacity, was a coercive order requiring the mother, against her will and without her consent, to place the girl in the ———— Sanatorium. In other words, the health authorities finding no necessity for quarantine measures, which, in many cases, may be resorted to when the public health is endangered, and discovering no law requiring the compulsory isolation of tuberculosis victims, thought it would be quite appropriate if the Juvenile Court would intervene and, under its wide discretionary powers, apply the necessary force. I declined to do so and have no apologies to make for the decision. Parenthetically, it may be observed that procedures of this kind are almost invariably

directed against illiterate and poverty-stricken individuals who must dumbly accept all official up-lift invasions of their private rights because they have neither the means nor, in many instances, the intelligence to resist.

The problem then has several aspects. You approach it from the humanitarian side, which is always a worthy approach and one that cannot lightly be brushed aside.

As an expert in a highly specialized field, you know that tuberculosis, one of mankind's greatest enemies, can best be treated in a well equipped and properly located sanitarium. Quite naturally you have little patience with a sufferer who fails to perceive so obvious a fact; and, from your letter, I gather that you likewise have little patience with a judge who apparently disregards scientific truth and, with a great show of obsequiousness to the rabble, sends a tuberculosis victim home instead of placing her in a hospital.

I do not wish to be too critical of this viewpoint, but I insist that there are other factors to be considered, especially if one is charged with any sort of governmental responsibility. I am well aware of those borderline cases where parental ignorance comes into conflict with recognized medical standards and where the hazard is more individual than public. And I am always sorely tempted to do *what I personally know will be best for the individual* even though there is some violation of personal rights. In some of these situations it seems fatuous to talk about personal rights. On the other hand, the most of us think and act, as the late Justice Cardozo once pointed out to the law students of Yale University, as our class thinks and acts; and, once we have arrived at an opinion with respect to what is good for others, we rather like the idea of giving it the force of the law. In the Juvenile Court this thought is constantly uppermost in my mind. The hearings are held behind closed doors and the persons involved are not only helpless but seldom represented by counsel. How easily then the Juvenile Court could degenerate into a star chamber proceeding with the judge imposing his own particular brand of culture and morals on indigent people—all under the guise of an extraordinary emergency!

Under our form of government, the family is the unit of society and the relation of parent and child should not be judicially disturbed unless the family situation is intolerable according to minimum standards. Ordinary poverty is generally the excuse but it is not always a justification for interference. And the same may be said for illiteracy. In other words, a poverty-stricken illiterate does not necessarily by that fact alone, forfeit the natural right of being the head of his family and making decisions for his minor children. These decisions are not always wise, and I have already said, there are many occasions when I am sorely tempted to override them and make the decision myself. The law is broad and these invasions of personal liberty can always find justification in the fact that a benefit is to be conferred on the recipient.

It should never be a question of what a judge has the *power to do* under broad statutes and conflicting legal precedents, but what he *ought to do,* keeping in mind always the entire picture of personal rights and their historic background. In recent years we have seen whole populations abroad yield to the seduction of paternalism, with its promises of prosperity and a better life, only to be ruthlessly exploited and persecuted. We do not want the lust for power which is now dominating the minds of so many little men, to wreck our heritage of freedom and individual initiative. To this end judges cannot approach any problem, even that of providing medical care for the indigent, without being alert to fundamental rights. Because a thing is good for an indigent does not always justify the application of force. If we could speak with absolute finality as to what is good and what is bad perhaps the end would often justify the means. But we cannot do this.

When a child needs medical or surgical care and is without parent or guardian, as often happens, I am only too glad to furnish the necessary consent. But when a parent, because of ignorance, opposes a particular method of treatment for his child, I do not always feel that I am justified in using compulsion, although I find myself out of sympathy with his viewpoint. Such was the case with the ———— family. One child had previously died after hospitalization and the illiterate mother believed that ———— would also die if sent away from her home. You may rest assured that I did not overlook the possibilities of this situation. Because our Juvenile Court sessions are quite informal, I spent the greater part of an afternoon trying to persuade the mother and the girl to accept the medical advice which had been given them. I pointed out the advantages which your splendid sanitarium offered and also the probability of death if the girl remained at home, but I could not penetrate the stupidity and superstition of these people and the session ended with considerable unpleasantness. I did, however,

respect their rights and I would do the same again.

Of course, as you must know, I am under no obligation to justify or defend any decision I may be called upon to make. I thought, however, you would appreciate this viewpoint which I have developed at too great a length.

Wishing you continued success in your work, I am,

Very truly yours,

AN OUTSTANDING EXAMPLE OF JOINT PLANNING

It is common to hear commendation of the benefits of joint planning by several agencies, but it is rare to find an example representing so complete a coverage as the following.

Nassau County, N. Y., a populous suburban area near New York City, located on Long Island, has a full-time county health department of which Earle G. Brown, M.D., is Commissioner. There is a County Tuberculosis Sanatorium of which James Walsh, M.D., is Superintendent. There is a County Tuberculosis and Public Health Association, of which Mrs. George E. Brower is President and of which Miss Frances H. Barbour is Executive Secretary.

The Tuberculosis and Public Health Association faced the year 1944 like many other similar voluntary groups with an unbudgeted surplus from the Christmas Seal Sale available for its program. At their initiative and with the coöperation of the State Committee on Tuberculosis and Public Health, George J. Nelbach, Executive Secretary, the State Commissioner of Health, Edward S. Godfrey, Jr., called an informal meeting to consider constructive suggestions for the expenditure by the Tuberculosis and Public Health Association of an unbudgeted balance of approximately $22,000. Represented at the conference was the State Department of Health through the Commissioner, with the General Superintendent of State Tuberculosis Hospitals, the Director of the Division of Syphilis Control and the District State Health Officer from his staff. Two members of the Nassau County Board of Health and the Commissioner of Health were in attendance, and the Medical Superintendent of the County Sanatorium. The President and the Executive Secretary of the Tuberculosis and Public Health Association, the Executive Secretary of the State Committee on Tuberculosis and Public Health and his assistant, and the Field Adviser to the Nassau County Association were present.

The conference explored fruitful expenditures for mental hygiene, for the expansion of tuberculosis case finding and services among family contacts, for the transportation of tuberculosis patients and family contacts to clinics, for the x-raying of general hospital admissions, and other parts of the tuberculosis program, such as rehabilitation. Other subjects were given consideration, such as the need for an expansion of adult health education services in tuberculosis and venereal disease control.

The entire meeting was reported in minutes which, as a pattern, may prove interesting to other agencies wanting to make group planning a reality. Copies may be obtained from Robert W. Osborn, Assistant Executive Secretary, 105 E. 22nd St., New York, N. Y.

CENTRALIZATION AND DECENTRALIZATION

In an article entitled "Shaping the Future of City Planning" (*Better Times*, December 31, 1943, published by the Welfare Council of New York City), Dr. Neva R. Deardorff, Assistant Director of the Welfare Council, discusses the individualistic districting of the city's services—fire and police protection, health, welfare, public schools. In New York none of these services use the same districts, or boundaries; only the Health Depart-

ment follows census tract boundaries. The result is that pertinent social data cannot be organized for the various school districts, welfare, or police districts. The effect of highly centralized city services, therefore, is a total decentralization for any community served and an utter confusion for the ordinary citizen as to where his government functions. Her article is illustrated with a map of one area showing the crisscrossing lines of the five city departments in comparison with which she says "a crazy quilt would appear orderly in design."

Dr. Deardorff's remedy is a fairly simple one: the districting of the city into a number of population groups with a civic center from which would radiate the city's services, each of which might have a different number of subdistricts but none would overlap the larger boundaries and none would violate census tracts. The actual building that housed the central offices of these services in each area would inevitably develop into a civic center and a symbol of government as it affects the day-to-day life of the citizen.

It occurs to us that this thinking has much in common with the planning of the Association's Subcommittee on Local Health Units. On the one hand, New York needs to rescue itself from the chaos of vertical centralization without horizontal coördination. On the other hand, the less populous areas of the country need for public health purposes, and undoubtedly for a great many other public services, a centralization of the numerous and overlapping responsibilities of small and uncoördinated units of government into a centralized unit large enough both to justify and support an adequate public health organization.

The horizontal coördination of various public services, the need for which is illustrated in the New York City situation, is not being lost sight of in the planning of the committee in that, with a few notable exceptions dictated by peculiar local conditions, county boundaries are not being violated in setting up local health units, although several counties may be joined together to form one health unit. Further, close collaboration with the U. S. Public Health Service Division of Hospital Planning assures that the planning of health and hospital jurisdictions does not overlook the need for horizontal coördination.

A NEWS LETTER YOU'LL READ TO THE END

The Venereal Disease Control Division of the Oklahoma State Health Department, Dr. G. F. Mathews, Commissioner, is responsible for an unpretentious, 2 page, mimeographed *News Letter* so beguilingly written that you are irresistibly lured to the end once you start it. Don't be misled by the adverbs. There is nothing whimsical or sentimental about it. It is full of wallop, unwelcome truth, and debunking of smug attitudes. We quote almost the entire first page of the February issue.

> That loud noise you just heard amounts to practically nothing. It was only the soldier-sailor contact reports ringing the bell for a new high in Oklahoma. Central Registry figures show that 372 service men were reported in January to have been infected with a venereal disease in this state. This compares with a former high of 358 in August and represents an increase of 30.9 per cent over the month of December when 284 infections were reported. Maybe it's just one of those things, a bad month when all the little spirochetes and gonococci got together and decided to put on a real show. And then again maybe this is the real thing. Maybe the textbook theory that venereal disease rates must inevitably increase in wartime is about to overtake the inch-by-inch progress for which we have so stubbornly fought during the past two years.
>
> Whatever the reason for this unexpected and totally unwelcome increase in service men infections, let's not be fooled by the comparatively good showing we have made in the Eighth Service Command for the same period. We have used that report too long as a criterion for what we have done and

what we must do. From now on, figures released through this publication will be Central Registry over-all tabulations. The Eighth Service Command figures make up only a part of the picture. For example, in January Oklahoma City had 39 contacts reported from the Eighth Service Command, but when all soldiers and sailors who were infected in Oklahoma City were totalled, it amounted to 89 infections. Tulsa had 18 infections reported in the Eighth Service Command report, but from all service commands, both Army and Navy, 48 infections originated there. And so on. . . .

We heard during the past month of an early syphilis patient who finally named 17 contacts but who gave only one on the original interview because the interviewer was satisfied with just one; of a contact who was able to get the name and even the clinic and patient number of the informant (that's nearly as confidential as a newspaper headline); of a wife who got a letter saying that her husband had gonorrhea and she would have to come into the clinic for an examination; of an acute gonorrhea contact who was not brought into the clinic for an examination because she was on her honeymoon in an apartment three blocks away.

RESPONSIBLE TO WHOM?

Health officials who may sometimes ponder the question of their responsibility will be given food for thought by the following occurrence. In a midwest state an outbreak of typhoid fever assumed sizable proportions with 6 deaths being reported. State health department officials promptly began an investigation and convicted "a product" (unnamed) which thereupon was "taken off the market," it was announced.

Understanding citizens in the affected region may have wondered what the "product" was and later whether they had any of it in their own cupboards—when a paper "leaked" the information that the product was cheese. One newspaper editorialized upon the action of the state health department in withholding the information in this vein:

> Granting that the firm was not at fault and may suffer some financial loss as a result of the publicity given it, the fact still remains that the public is entitled to know just how and where the epidemic started. In the first place some of the company's suspected products might still be on hand in some kitchens, and in the second place all manufacturers of cheese and butter would naturally come under unjust suspicion if the name of the offender had been kept secret. A policy of laying all the cards on the table is usually best anyway in all such matters of public interest or welfare.

We are indebted to the *Health Officers News Digest*, published by the Public Health Committee of the Cup and Container Institute, for the above, which as a proffered contribution to the former, seemed to its editors and to us, a thought-provoking question to pass on to readers of Credit Lines. It reached Credit Lines while a recent report from a Food and Drug Division of a State Health Department was under review. The reviewer was particularly receptive because he was already infuriated by the careful anonymity shrouding "products" which had admittedly been found on examination to be unfit for human consumption, or dangerous to the public health. We echo the question, responsible to whom? Responsible to the manufacturers of "Product A," or the wholesale outlet for "Sample 102," so that the worthless stuff may continue to be profitable, or responsible to the people whose health they are employed to protect?

DADE COUNTY TURNS OUT ITS FOOD HANDLERS

One of the most successful schools for food handlers yet conducted by U. S. Public Health Service's Major L. H. Male and Dr. T. H. Butterworth was sponsored March 14–21 by the Dade County Health Department, Miami, Fla.

The course, covering primary phases of sanitation, bacteria, personal hygiene, food poisoning, storage, and refrigeration consisted of three lessons, each repeated four times. The subjects were

dramatized and supplemented by demonstration, slides, and moving pictures.

Total attendance was 4,738 and included home economic classes, the KP contingent from the local Naval base, and personnel from virtually every type of eating establishment in the county. There was seldom "standing room" in the Central School auditorium where the course was held, and Major Male declared he "hadn't seen anything like it," when asked to compare the attendance with similar schools he has conducted.

Russell Broughman, Bureau of Sanitation director for the County Health Unit, had more than 3,000 food handlers registered through his sanitary inspectors before the school opened—the remaining were registered at the school.

Careful check was kept of attendance, and each person who attended the required three classes received a certificate. Establishments that enrolled 75 per cent of their personnel also received certificates. Some eating houses compelled their entire employee group to attend the course and some even closed at specific hours to allow the personnel to take advantage of the free classes of instruction.

At the suggestion of the Florida State Board of Health, sanitation officers from other county health units attended the course, with the aim of holding similar schools periodically in their counties. Coöperating with the Dade County Health Department and U. S. Public Health Service was Robert G. Carter, technical sanitarian of the Florida State Board of Health.

DR. ROBERT HUGHES PARRY AT HOME

More than 3,000 public health workers in western states and several hundred persons in New York City and elsewhere in the East had the opportunity to meet Dr. Robert Hughes Parry, Health Officer of Bristol, England, when he visited the United States last spring. They will be interested in an account of a recent week-end which Dr. Albert S. McCown, formerly Medical Director of the American Red Cross, and now an officer of the U. S. Army stationed in England, spent with him at his home in Bristol.

Excerpts from Dr. McCown's letter follow:

I went down to Bristol on the Saturday morning train, arriving in time for lunch, stayed over Sunday, made some official visits Monday morning, and returned Monday afternoon.

I cannot tell you what a satisfaction it was to see Dr. Parry in his home environment. His wife is a charming person, a Captain in the British Medical Corps, doing a splendid job in the transfusion service. I shall not attempt to describe their home; their gardens; their friends; nor the place they occupy in the life of Bristol. You will have to come and see it for yourself, and I do hope that some day you will have that privilege.

The purpose of this letter is to confirm for you and the other members of the troupe the accuracy of Dr. Parry's descriptions of Bristol, as immortalized in the famous opus we heard on so many occasions.

First of all, of course, I saw the famous River Avon, down which some famous journeys were made. John Cabot, among others, sailing out to discover a new world, not forgetting that one of the promoters of that voyage was the Sheriff of Bristol, a Mr. Americke. Dr. Parry insists that "whatever the Italians say, we in Bristol *know* that that was the origin of the word America."

Bristol is a City of Churches, mostly burnt out now, built with money made out of the slave trade, a sort of Beveridge scheme for the next world. Now, in the year of our Lord 1944, we find that Bristol's gift of slaves is being returned to Bristol with interest.

I saw, too, St. Mary of Redcliff, which Queen Elizabeth said was the most beautiful Parish Church in England, and so it must be, because no one has ever dared to disagree with Queen Elizabeth!

Sunday afternoon we drove up the road to Cheddar, through the rocky Combe of Barrington, where the Vicar of Blagdon, the Rev. A. M. Toplady, caught in a storm of thunder, lightning, and torrential rain, found refuge in a cleft in the rocks, and, as a result of that experience, wrote the hymn, "Rock of Ages, Cleft for me, Let me hide myself in thee."

On the way back we passed the quay-side of the Port of Bristol, immortalized by Robinson Crusoe and John Silver, and on past the site where St. Peter's hospital used to be, and where worked William Budd, the father of epidemiology. I saw no statue to Jenner. Undoubtedly this would not have been permitted by the anti-vaccinationists, since Bristol is their headquarters. I saw the little brick "cottages"—with their amenities. (Just between you and me they are really two story brick houses but the Bristolians insist on calling them cottages, and cottages they must remain.)

From without, I worshipped at the Chapel of John Wesley, the Founder of Wesleyism and saw the Castle stormed by Sir Thomas Fairfax during the Cromwellian period. It was the same Fairfax family who figured so largely in early American history, it being a Lord Fairfax who owned tremendous estates in Virginia who was surveyed by a youthful George Washington.

In Dr. Parry's own home I saw a Morrison style shelter, just as he had described it. Fortunately there was no necessity to use it during my visit.

So completely delightful was the trip, and so wholehearted the welcome, that Hugh Smith and I plan to go down for another week-end in the near future.

RHEUMATIC FEVER

"Fortunately," says the Children's Bureau, "there is increasing interest in many states and communities in the problems related to the rheumatic child." New releases by the Bureau on the subject include a 4 page pamphlet entitled "Some Facts about Rheumatic Fever" packed full of information. It is to be regretted that a subject of such great importance has to be presented in a format and make-up that reflect some of the limitations under which federal agencies operate in the printing field.

Also being currently distributed by the Bureau is a table showing the state services for children with rheumatic fever that were financed in whole or in part by official state agencies under the Social Security Act, Title V, Part 2, for the year ending December 31, 1942.

The Wisconsin Anti-Tuberculosis Association Social Workers' *Bulletin* dated March 20, 1944, begins what is apparently a series of articles on the subject of rheumatic fever and heart disease. It calls attention to the fact that more than 7,000 children in Wisconsin have rheumatic heart disease, that rheumatic fever produces nearly 50 times as many cripples and semi-invalids as infantile paralysis, and that the disease is responsible for more deaths of children under 15 than tuberculosis. It then goes on to discuss cause, onset, course, complications, and treatment. Its purpose is evidently to inform a non-technical audience, and is well served. Miss Metta Bean, Director of Social Service, signs it. We shall watch for the next issue.

"WHAT YOU NEED TO KEEP STRONG AND WELL"

The Maternal and Child Health Division of the Georgia Department of Health has prepared an informative chart which teaches elementary nutrition lessons in brief text and pictures. Three concentric circles around a sketch of two children show in the first circle "what you need"—vitamin D, vitamin C, etc. The second and third circles synchronize "what it does" and "where you find it," respectively, with vitamin D, vitamin C, etc. The chart is reproduced in black and white with a red border, probably the colors of the original, in *Georgia's Health* for February, published by the Georgia Department of Public Health, Thomas F. Abercrombie, M.D., Director.

CHILDREN: $7,763 EACH

Health workers who are seeking data to emphasize the money value of human life will be interested in the computations recently published by the Metropolitan Life Insurance Company through the *Statistical Bulletin*, Volume 25, No. 1, January, 1944. Tables are presented showing average expenditures

for bringing up a child to the age of 18 by type of expenditure and by various family income levels. Similar figures are presented year by year showing how the accumulations are arrived at.

According to these figures, it costs $7,763 to bring up the average child in a family with $2,500 income and, for a family with $5,000 to $10,000 annual income, the average figure rises to $16,337.

MORE ON ANNUAL REPORTS

It is difficult to do justice to an annual report of a health department, a voluntary agency, a hospital, or any other organization in anything but a full-length review. Too much time and effort go into their preparation to brush them off lightly, even if, as the lad with the harmonica said, "I blow it in so sweet and it comes out so sour."

Because full-length reviews are out of the question, we had decided not to talk about any. In spite of this commendable determination, a handful of especially striking ones, from a variety of sources, for one reason or another, persistently haunts us, and to lay their ghosts, we give them brief mention. They were all blown in sweet and came out that way.

Dr. Edward G. McGavran, Commissioner of Health, St. Louis County Health Department, Clayton, Mo., issues his annual report for 1941 and 1942 under the title "St. Louis County Health in Defense and War." The front cover reproduces a photograph of the attractive new building. There is good balance between readable text and sketches, maps, and graphs. The budget included is unencumbered and understandable.

The Fifth Annual Report of the Housing Authority of the City of New Haven, Conn., which is called "Then and Now" and is Chapter Three of a series, is an appealing document, with excellent photographs facing nearly every page of text and a double spread in the center. Seeing it reminds us that it is important not only to build good houses but to interpret the project to the public. This is good interpretation.

Dr. Charles F. Wilinsky, Executive Director of Beth Israel Hospital, Boston, Mass., makes his report for 1943 a living document even for those who have no particular reason for being concerned with its contents. There is a nice balance between the more systematic narrative and the tables, photographs, and other information.

Interesting approaches to a method of bringing to a community an understanding of its health problems have been used by the State of Nebraska's Department of Health, C. A. Selby, M.D., Director, and by the Spartanburg, S. C., County Health Department, John B. Gelzler, M.D., Director. The first is an almanac, true in size, mustard-yellow cover, news-print paper, and arrangement—true in everything but content—to the old-fashioned kind that used to be put out by Glover's Mange Cure or something similar. The second is a calendar with photographs and a minimum of text.

In "Fifty-Two Weeks with the Louisville and Jefferson County Health Department," Dr. Hugh R. Leavell, Director, takes you through the year and through his department, provocatively and illuminatingly. He rings the bell with his various devices all the way from the title page on through the simple but revealing diagrams of the first page, through the excellent letter of transmittal and into the body of the report.

Small in size, only 5¼ x 3½ inches as it goes through the mails, but telling a big story in its 8 pages, the 26th annual report of the Maternity Center Association, 654 Madison Avenue, New

York, N. Y., is arresting with its title "A Letter from the South Pacific." The introductory copy is moving and the five paragraphs of "some of the things the Association has been doing" are masterpieces of condensation.

"Health Progress through Team Work and Citizen Participation" is the 26th Annual Report of the Public Health Federation and its Councils, Cincinnati, Ohio, Bleecker Marquette, Executive Secretary. Well printed and illustrated, it is a remarkable record of exactly what its title describes.

In tabloid newspaper form, the Warren County Health Department, Bowling Green, Ky., Paul Q. Peterson, M.D., Director, distributes its annual report. It does not have to depend on health department envelopes for mailing. It goes as a special section of the *Park City Daily News*.

"Health in Hartford" for the years 1941 and 1942 is an ambitious 90 page book to which each Bureau has contributed a chapter. It is a factual, detailed account of the activities of a wide-awake, effective health department. Three merged photographs on the cover cleverly assemble laboratory beakers, motion picture reel, the National Health Honor Roll plaque, and other objects relating to each aspect of the department's work. The Health Officer of Hartford, Conn., is Alfred L. Burgdorf, M.D.

Photographs, sketches, maps, and graphs enliven the 54 pages of the "Report on Health and Safety Project of the Girl Scouts, *1939–1942.*" A comprehensive job has been done here both in the project and in the report. The story is worth telling and is well told.

WORTH QUOTING

Sir William Beveridge suggests as peacetime objectives "making men as free as is humanly possible of the five giant evils—of want, of disease, of ignorance, of squalor, and of idleness, the idleness enforced by mass unemployment. I believe that if we attack those first four giants with all our might, if we spend ourselves generously and our money wisely against want, disease, ignorance, and squalor, we shall find that in the process we have killed also the fifth giant of mass unemployment."

Henry Wallace says—"Second to good and plentiful food I would put good and plentiful hospitals. With more hospitals adequately equipped and staffed, combined with a common sense public health program, we can stamp out tuberculosis, syphilis, and possibly malaria. . . . We ought to be spending 4 times as much on hospitals and doctors and nurses as we are now spending. . . ."—Reprinted from *Washington News Letter on Social Legislation*, February 23, 1944.

BOOKS AND REPORTS

Soviet Health Care in Peace and War—*By Rose Maurer. New York: American Russian Institute for Cultural Relations with the Soviet Union, Inc. (56 West 45th Street),* 1943. 48 pp. Price, $.10.

Soviet Health Care in Peace and War is a pamphlet 48 pages in length, giving a descriptive but uncritical review of what the Soviet Union has planned and has been doing in the care of the health of its citizens before the Nazi attack and since. The brochure begins, quite appropriately enough, with the discussion of health protection at the place of work, and then treats briefly such subjects as District Health Centers, Special Care for Women, Child Care, Rural Medical Service, Medical Education, etc.

The reading of this brochure affords one a rather general idea of what the Soviet Union has been trying to do in the way of health conservation. One cannot, however, obtain a clear idea as to how the plans have worked out from the data given. The statistics quoted by the writer are rather crudely formulated and frequently are quite unintelligible.

In the Section "Health Statistics" (page 25), there are some rather meaningless comparisons made between the prevalence of certain diseases in Russia and in the United States. They are meaningless because it is doubtful whether the reporting of morbidities in Russia can possibly approximate that of the United States. There is a marked absence of mortality statistics by which medical service and the state of the health of the people might somehow be gauged.

In these respects then the brochure is seriously deficient.

Part II, which is devoted to Soviet Medical Care in Wartime, makes particularly interesting reading since it describes how the Soviet Union has met the problems of the health care of its vast army.

The pamphlet is tinged with a propagandistic color, which is understandable enough, but one is left with the wish that it had more solid facts and fewer vague generalizations.

IAGO GALDSTON

The Hospital in Modern Society—*By A. C. Bachmeyer, M.D., and Gerhard Hartman, Ph.D. New York: Commonwealth Fund,* 1943. 760 pp. Price, $5.00.

It is interesting to note how exceedingly few textbooks have been written and are available on the subject of hospital administration. This is true in spite of the fact that hospitals represent an investment of over 4 billions of dollars, employ normally a million people, and there is expended annually in excess of 800 millions of dollars for the hospital care of the American people. Surely the enormity of this structure and the tremendous volume of service rendered justifies the ready availability of authoritative material on the essential aspects of hospital service.

The great need for information for the guidance of hospital administrators, their personnel, and others interested in this field, has been met by some of the many articles which appear in the three leading monthly hospital journals, as well as in those dealing with medicine, public health, nursing, etc. The knowledge, experience, and broad background developed over a period of years by the able authors of this book have been applied to the careful compilation of

papers published for more than a decade on the subjects of great interest to those concerned with the varied services involved in hospital management. It is not too much to claim that the list of authors of these articles includes the leaders in the field of hospital administration, as well as in intimately related fields.

The strength of this book lies not only in its inclusion of carefully selected reading material on varied subjects, but also in the provision at the conclusion of each chapter of a substantial list of "References for Further Reading." Totaling 760 pages, divided into 5 parts, and 19 chapters, and including approximately 150 articles and committee reports, it should be a welcome addition to the too meager number of textbooks on this important subject. It should serve as a ready aid and guide to hospital administrators, and their assistants, hospital department heads, trustees, and others concerned with hospital administration.

CHARLES F. WILINSKY

Statistical Abstract of the United States, 1942—*U. S. Department of Commerce, Bureau of the Census (64th ed.). Government Printing Office, Washington,* 1943. 1,097 pp. Price, $1.75.

The 1942 *Statistical Abstract* is the 64th edition of this compendium of the industrial, social, and economic history of the United States as portrayed in figures. In 996 tables, 35 basic subjects such as Vital Statistics, Social Security, Manufactures, Banking and Finance are summarized, an increase of 144 tables over the 1941 edition covering the same subjects. In contrast, the 1920 edition covers 15 basic subjects in 462 tables.

Like the dictionary, this volume has no plot and, like that volume also, one can spend many interesting and enlightening hours with it, for it contains both solidly practical and esoteric information. One finds, for example, that Vital Statistics first appeared as a major subject in 1921 with 12 tables; by 1942 professional and public interest apparently required 22 tables to cover the subject adequately. Social Security first appeared as a major subject in 1939, with 13 tables; in the 1942 edition it has 39 tables.

This reviewer was interested in finding out what was happening in the field of manufacturing in those years when our world was whirling all too ignorantly to its present catastrophe. Between 1937 and 1939—the latest figures available—tobacco, rayons, apparel, both men's and women's, millinery, fur coats, silverware increased in number of workers and value of products, but iron and steel, electrical, agricultural and other machinery, automobiles, railroad equipment, petroleum products, even food products, decreased. Only aircraft and shipbuilding, among the basic manufactures later to be supremely important for war production, were greater in 1939 than in 1937.

As in other recent years, the present volume has a Bibliography of Sources of Statistical Data and each table is annotated as to its source.

MARTHA LUGINBUHL

Trends in Nursing History—*By Elizabeth Marion Jamieson and Mary Sewall (2nd ed). Philadelphia: Saunders,* 1944. 651 pp. Price $3.00.

The second edition of *Trends in Nursing History* brings the events in the nursing world up to date—as of October, 1943. For a rapid review and an encyclopedic type of reference book, this *History* serves. It lacks continuity of subject development and omits reference to some of the important and colorful original sources which make history come alive for the student.

Events, people, and organizations in their proper chronological order are

described without much critical evaluation. The result is a "spotty" narrative, which nevertheless covers an amazing range of topics. Chapters XI–XV offer fairly satisfactory background reading for students ready to tackle current events in class discussion.

DOROTHY DEMING

Clinical Laboratory Methods and Diagnosis—*By R. B. H. Gradwohl. (3rd ed.). St. Louis: Mosby,* 1943. 2 vol. 2,130 pp. 57 color pl. Price, $20.00.

Because of the accumulation of material dealing with laboratory examinations, this work now occupies 2 large volumes containing a total of 2,130 pages, exclusive of 100 pages of index (duplicated in each volume) and accessory pages. It is a veritable encyclopedia of information of value to any person having an interest in diagnostic bacteriology, parasitology, serology or chemistry and related fields. However, it is a work on methodology and is not a textbook for students or a manual for amateurs. It assumes a good knowledge of each subject covered. It includes chapters on hematology, blood grouping and transfusion, blood and urine chemistry, and covers an impressive range of special tests and technics in all of these fields, as well as in vitamin deficiency diseases, atopy, food chemistry, pregnancy, semen appraisal, toxicology, and the like. There is an interesting chapter on detection of crime by laboratory methods, and others on autopsy technic, preparation of museum specimens, and tissue cutting and staining. There is a discussion of penicillin. The chapter on the serology of syphilis is especially extensive and detailed. Practically any laboratory procedure (or an alternative) that is likely to be of value in medicine, toxicology, and related fields is to be found here with pertinent commentary, interpretations, and references to literature both old and recent. There are 57 color plates and scores of instructive half-tones and line drawings. The chapter on supplies and equipment should prove helpful to those setting up new laboratories as well as to others responsible for laboratory work.

It seems probable that no author can prepare such a monumental work free from error or from statements with which some readers will disagree or from basis for criticism as to choice of material. Bacteriologists will find some reason for complaint in these respects, and so doubtless will specialists in other fields. However, the volumes under discussion share these common failings, in no excessive degree, so that the 3rd edition of this book may be recommended as a highly valuable contribution to any technical book shelf. The printers, proofreaders and binders and publishers are to be congratulated on a fine job of book manufacture.

MARTIN FROBISHER, JR.

Occupational Lead Exposure and Lead Poisoning—*A Report Prepared by the Committee on Lead Poisoning of the Industrial Hygiene Section of the American Public Health Association. New York: American Public Health Association,* 1943. 67 pp. Price, $.75.

This publication brings together in a small volume the important facts known about lead exposure and lead poisoning. According to the foreword, "The purposes of this report are (1) to outline practical and effective measures for the recognition and prevention of hazardous lead exposure in industry, (2) to describe satisfactory methods for the differential diagnosis and treatment of lead intoxication, (3) to point out the factual requirements for medico-legal purposes and the means of satisfying such requirements, and (4) to refer the reader to selected sources of more detailed and comprehensive information." These four purposes are

admirably carried out, and the professional ability of the eight men on the committee is excellent evidence that the information is reliable. The appendix gives a very informative classified bibliography for those who wish more details on any phase of the subject. This volume should have a wide circulation among physicians, industrial engineers, and clinical pathologists. FRED J. WAMPLER

Educators Index of Free Materials—*Edited by John Guy Fowlkes. (29th ed.). Randolph, Wis.: Educators Progress League,* 1944. 165 pp.

The *Educators Index of Free Materials* gives clear proof that schools do more than give lip service to the oft-heard doctrine of "enriching the curriculum." The *Index,* of which Dr. John Guy Fowlkes, Professor of Education, University of Wisconsin, is editor, made its first appearance in March, 1937, and is now serving approximately 100,000 teachers in all sections of the country.

Printed on stiff, 3-ply index cards, 5 x 7½", it is revised annually and semi-annually; the present edition of January, 1944, is its 28th revision.

The *Index* covers the whole school curriculum, and the sources of the free material listed include departments of the federal government, foreign governments, agricultural experiment stations and other state institutions, chambers of commerce, travel bureaus, human welfare foundations, and industrial concerns.

Health education is given due place in the *Index.* Also, under Wartime Education are found materials on first aid, guidance, nutrition and diet, physical fitness and recreation; under Applied Arts, home economics, including family relationships and child craft, foods and health, housing. Under Science and under Social Studies are found a variety of materials bearing on the health field. Health films, slides, charts and posters are listed under Visual Education. Altogether, upward of 2,000 annotated materials, free for the asking, are listed in this Educators Index.

Many of the names of the professional health agencies do not appear in the *Index.* The listings under Health Education do not form a well rounded presentation of this subject; obviously, the reason is that free materials on all phases of it are not available. Are we, as professional health educators, doing all that we might to make sure that the schools are well provided with the best there is in this field?

The *Educators Index* is more than a useful tool to schools. It is a valuable stimulus to starting a school library. Moreover, it offers a challenge to the health profession to see to it that good free material is made available to the schools covering the whole field of health education.

LOUISE STRACHAN

Vital Statistics Rates in the United States: 1900–1940—*By Forrest E. Linder and Robert D. Grove; supervision of Halbert L. Dunn, M.D. Bureau of the Census. Washington: Supt. of Documents,* 1943. 1051 pp. Price, $1.75.

This is one of the most useful books that have ever appeared in the field of vital statistics. It is difficult to review because each of the 71 tables presents fascinating statistical vistas that invite exploration. The volume is the more welcome because its predecessor, *Mortality Rates, 1910–1920,* is now over twenty years old.

As to the general structure of the volume, it is to be noted that of the 71 tables, 45 give mortality rates, 9 give natality rates, and the remaining 17 give underlying population tables. Numbers of births and deaths are not given. To have done so would have doubtless

made the volume too bulky. Nevertheless, these numbers can, if necessary, be calculated from the population and rate tables.

Roughly, a fourth of the tables give data for each state. A few show city and county data. Summaries for the expanding registration area are given for nearly all of the tables. Only four of the mortality tables, however, show time series for the registration states of 1900. This, in the opinion of the interviewer, is somewhat regrettable, for expansion of the registration area from the ten original death registration states (plus D. C.) in 1900 to the whole United States in 1933 brought into the area increasing proportions of young, colored, southern, and rural populations. These distortions can to some degree be neutralized by using tables which are specific for age, race, etc. What is more disturbing statistically is that, in expanding, the registration area took in states with less complete birth and death registration and probably poorer diagnostic standards. The book might, therefore, have profited by including more summaries for the registration states of 1900 or 1910.

About half of the tables have a cause of death breakdown. By skillful use of abridged lists it was found possible to pack into this volume a considerable amount of cross tabulation of cause of death with age, race, sex, and month. The occupational breakdown was omitted, probably wisely, because of its limited usefulness in relation to the amount of space demanded. Marital status has also been dropped.

It is, of course, practically impossible to set up an ideal set of tabular patterns until the tables have actually been in use. It may be helpful, therefore, to indicate the information which the reviewer has already sought in the book without success.

1. A tuberculosis time series by sex for single years near 1918.

2. Certain time series for the original registration states by age-cause-race.

3. Data for broad age groups such as 45 or 55 and over. To calculate these from rates and populations would be a considerable chore.

4. Data for age one. The decline in mortality probably was heaviest in that year. The tables give ages 1–4 only as a group.

In general, it appears that cause of death data could profitably have been expanded; and some of the space-consuming state tabulations left to state offices for publication. On the whole, however, reference to the book has been notable for the large proportion of successes rather than by the few failures.

The introductory text covers 119 pages. Although much of this information is extremely interesting, this reviewer questions whether so much general didactic information was necessary or desirable for a book of statistical tables. Philosophical discussions may interfere with proper reference to statistical tables by concealing basic definitions, indexes and explanations. Most of this material really belongs in a textbook.

Chapter 4, giving an informing, though somewhat extended discussion of age adjustment of rates is relevant, in view of the omission of standardized death rates from the volume. Chapter 5, entitled "Description and Explanation of the Tables," is quite essential to the proper use of the volume and the reader is urged to go over this chapter carefully. The ingenious tabular indexes in this chapter should be studied with particular care. These eleven pages should be used more than any others in the book and a permanent book mark or thumb index of some sort is advisable. Some readers may wish to include a column for residence allocation, which unfortunately was not included in the table.

One of the most commendable innovations is that the volume has been reduced to a cover size which, unlike

the earlier mortality volumes, will fit a standard bookcase, is easy to handle, and can be kept or used on a desk without upsetting ink wells or monopolizing undue space. This is fortunate, for every person with any interest in vital statistics will want to keep this excellent little volume constantly within arm's reach. Unless this reviewer is mistaken, the book will exert a profound effect upon public health thought and action for years to come.

A. W. HEDRICH

Rockefeller Foundation—International Health Division, Annual Report, 1942—*New York (49 West 49th Street).* A limited number of copies available upon request. 194 pp.

This report presents the activities and expenditures of the International Health Division for 1942 under the following headings: Control and Investigation of Specific Diseases, Aid to State and Local Health Services, Public Health Education, and Table of Expenditures. The diseases under investigation and control included yellow fever, influenza, primary atypical pneumonia, typhus fever, rabies, malaria, diphtheria, scarlet fever, tuberculosis, hookworm disease, and syphilis. Studies of nutrition and mental hygiene were also reported.

The work on yellow fever included further studies and extensive use of yellow fever vaccine, with particular attention to post-vaccination jaundice associated with the employment of human serum in the vaccine. Also, the epidemiology of jungle yellow fever in Colombia and northeastern Africa received special attention. The work on influenza was concerned mainly with the immunology of the disease and attempts to develop an effective vaccine. In typhus fever, the relationship between classical and murine strains was studied, and new insecticides against lice were developed. Rabies vaccine prepared by treatment with chloroform was shown to maintain its effectiveness for a least a year for the immunization of dogs. Malaria studies included a search for better chemotherapeutic agents and studies of immunology and histopathology of malaria, and the morphology of *Plasmodium falciparum.* Extensive studies on malaria mosquitoes and their control in Florida, the Caribbean area, and India were also conducted. In diphtheria, the antigenic properties of avirulent bacilli were studied and the identity of the toxin of mitis and gravis strains was established. The work in scarlet fever consisted of the analysis of the studies of strains of hemolytic streptococci causing the disease in Roumania and other parts of the world. In tuberculosis, a study of vaccination in Jamaica using heat killed bacilli was completed showing some apparent degree of protection. The epidemiological study in Williamson County, Tenn., was also continued with emphasis on family transmission, and a study of pulmonary calcification. In the field of nutrition, studies were continued in rural areas of Tennessee, North Carolina, England and Spain, and were extended into Mississippi and Canada.

Aid to state and local health services was given in North Carolina, Mississippi, New York City, and a number of provinces in Canada. Certain Latin American countries and China also received aid in their public health programs.

The schools of public health receiving assistance included those of the University of Michigan, Johns Hopkins, Harvard, Toronto, Sao Paulo, and the National Institute of Health of China. Schools of nursing which received assistance included those of Skidmore College, Venezuela, Panama, Sao Paulo, Brazil, and Lisbon, Portugal.

The Division granted 135 fellowships and training grants to public health personnel chiefly from Latin America.

This brief review indicates the wide range of activities of this most valuable international agency. Although much of its activity has been directed toward the war effort, many constructive peace-time programs have been continued and initiated. The expenditures totalling over $2,300,000 were about equal to those in previous years.

HENRY E. MELENEY

BOOKS RECEIVED

LABORATORY METHODS OF THE UNITED STATES ARMY. Edited by James Stevens Simmons and Cleon J. Gentzkow. 5th ed. Philadelphia: Lea & Febiger, 1944. 823 pp. Price, $7.50.

PRINCIPLES AND PRACTICE OF MEDICINE. By Henry A. Christian. 15th ed. New York: D. Appleton-Century, 1944. 1,600 pp. Price, $9.50.

MICROSCOPIC TECHNIQUE IN BIOLOGY AND MEDICINE. By E. V. Cowdry. Baltimore: Williams & Wilkins, 1943. 206 pp. Price, $4.00.

RORSCHACH'S TEST. By Samuel J. Beck. Vol. 1. New York: Grune & Stratton, 1944. 223 pp. Price, $3.50.

THE JEWS AND MEDICINE. By Harry Friedenwald. Vol. I. Baltimore: Johns Hopkins Press, 1944, pp. 1–390. Price, $3.75.

THE JEWS AND MEDICINE. By Harry Friedenwald. Vol. II. Baltimore: Johns Hopkins Press, 1944, pp. 391–817. Price, $3.75.

FOUNDATIONS OF NUTRITION. By Mary Swartz Rose. Revised by Grace MacLeod and Clara Mae Taylor. 4th ed. New York: Macmillan, 1944. 594 pp. Price, $3.75.

THE ART AND SCIENCE OF NUTRITION. By Estelle E. Hawley and Grace Carden. 2nd ed. St. Louis: Mosby, 1944. 668 pp. Price, $3.75.

HEALTHFUL LIVING FOR NURSES. By Harold S. Diehl and Ruth E. Boynton. New York: McGraw-Hill, 1944. 205 pp. Price, $2.50.

FOOD CHARTS. Prepared by Joint Committee of the Council on Foods and Nutrition of the American Medical Association and of the Food and Nutrition Board of the National Research Council. Chicago, Ill.: American Medical Association, 1942. 20 pp.

ORGANIZING TO HELP THE HANDICAPPED. By Arthur Turner. Elyria, Ohio: National Society for Crippled Children, Inc., 1944. 165 pp. Price, $1.00 (Cloth), $.50 (Paper).

INADEQUATE DIETS AND NUTRITIONAL DEFICIENCIES IN THE UNITED STATES. Report of the Committee on Diagnosis and Pathology of Nutritional Deficiencies. Bulletin No. 109. Washington, D. C.: National Research Council, 1943. 56 pp. Price, $.50.

THE PROBLEM OF CHANGING FOOD HABITS. Report of the Committee on Food Habits. Bulletin No. 108. Washington, D. C.: National Research Council, 1943. 177 pp. Free.

RECREATION FOR ALL AGES. By Lili Heimers. Edited by Margaret G. Cook. Upper Montclair, N. J., 1943. 66 pp. Price, $1.00.

EMPLOYEE COUNSELING. By Helen Baker. Princeton, N. J.: Industrial Relations Section, Dept. of Economics and Social Institutions, Princeton University, 1944. 64 pp. Price, $1.00.

DUST HAZARDS IN AUSTRALIAN FOUNDRIES. By A. A. Ross and N. H. Shaw. Melbourne, Australia: Industrial Welfare Division, Dept. of Labour and National Service (Technical Report No. 1), 1943. 45 pp.

SUMMARY OF STATE LEGISLATION REQUIRING PREMARITAL AND PRENATAL EXAMINATIONS FOR VENEREAL DISEASE. By Aneta E. Bowden and George Gould. 2nd ed. New York: American Social Hygiene Association, 1944. 30 pp. Price, $.25.

YOUNG OFFENDERS. By A. M. Carr-Saunders, Hermann Mannheim and E. C. Rhodes. New York: Macmillan, 1944. 168 pp. Price, $1.75.

GUIDING THE NORMAL CHILD. By Agatha H. Bowley. New York: Philosophical Library, Inc., 1943. 174 pp. Price, $3.00.

SOCIAL SECURITY: PRINCIPLES AND PROBLEMS ARISING OUT OF THE WAR. Report IV (1). International Labour Conference. Montreal, Canada: International Labour Office, 1944. 115 pp. Price, $.60.

SOCIAL SECURITY: PRINCIPLES AND PROBLEMS ARISING OUT OF THE WAR. Report IV (2). International Labour Conference. Montreal, Canada: International Labour Office, 1944. 82 pp. Price, $.50.

A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

RAYMOND S. PATTERSON, PH.D.

First on Your Reading List—Last fall a commission undertook a clinical trial of inactivated vaccine of influenza virus A and B, upon 12,500 army S. P. T.'s—a highly stable population. Vaccination performed just before or even after the onset of the epidemic protected at a ratio of 3.2 to 1 over the controls. (In some of the units the ratio was 5 or 6 to 1.) The effect of the vaccine becomes evident in about a week but the duration of the protective values has not been determined. More findings are promised.

ANON. A Clinical Evaluation of Vaccination Against Influenza. J.A.M.A. 124, 14: 982 (Apr. 1), 1944.

V. D. Case Finding Is War Work—Where generalized public health nurses have been permitted to participate in the venereal disease case finding program, they have been successful, asserts this competent commentator.

BURKE, M. A. Improvement of Present Methods for Extrafamilial Contact Tracing. Ven. Dis. Inform. 25, 1:9 (Jan.), 1944.

How to Delouse a Town—There is this much to be offered to the credit of conscientious objectors: these men allowed themselves to be infested with body lice in order that the effectiveness of certain insecticides might be tested. Myself, I'd rather take my chances against the lower but pleasanter vermin—the Japs.

DAVIS, W. A., and WHEELER, C. M. The Use of Insecticides on Men Artificially Infested with Body Lice, (and) DAVIS, W. A., *et al.* Studies on Louse Control in a Civilian Population. Am. J. Hyg. 39, 2:163 (Mar.), 1944.

A Few Words on a Big Subject—It will do you not a bit of harm to have absorbed a first hand account of the methods used to safeguard the shipyard workers. This paper hits only the very highest spots but it is eminently readable.

DRINKER, P. Shipyard Health Problems. J. Indust. Hyg. & Toxicol. 26, 3:86 (Mar.), 1944.

For the Drowned—Preferred by the British Navy to the Schaeffer method is rocking. Ankles and wrists of the victim are lashed to the four corners of a stretcher placed over a horse. This see-saw is rocked ten times a minute until breathing commences or until everyone gives up. The Schaeffer method is put into action until the mechanism can be assembled.

EVE, F. C. Resuscitation of the Drowned Today. J.A.M.A. 124, 14:964 (Apr. 1), 1944.

With Not a Blow Below the Belt—Every single one of us—without exception—should read these two outstanding papers pro and con the adoption of a compulsory medical prepayment plan. Both addresses are singularly, and happily, free of Billingsgate. Both give off a bright light with a minimum of heat. Would to God all discussers of this question might learn to argue with as much cogency and courtesy!

FALK, I. S. Proposed Extension of the Social Security Program, with Special Reference to Health and Medical Aspects, (and) FAXON, N. W. The Blue Cross, the Blue Shield, and the Wagner-Murray-Dingell Bill. New Eng. J. Med. 230, 9:244 (Mar. 2), 1944.

One Hundred and Seventy-two Different Diseases—Exhibit A of the bewildering variety achieved by our several and sovereign states in the mat-

ter of reportable disease. The exhibit has to be seen to be believed: three require the reporting of colds and one each are listed as calling for bronchitis, diabetes, heat prostration, or milk sickness reports.

FOWLER, W. The Reportable Diseases. Pub. Health Rep. 59, 10:317 (Mar. 10), 1944.

Good for Your Soul—This wholesome dissertation on how little we really know when we talk glibly about virus pneumonias should be taken to heart by us all. Atypical pneumonia is not due to *a* virus, but may be due to any of a variety of causes. The paper closes with the pointed reminder that bacterial pneumonias still exist and measures for their detection should not be neglected.

FRANCIS, T., JR. Virus Pneumonia. Canad. Pub. Health J. 35, 2:49 (Feb.), 1944.

State-wide Mosquito Survey: How Long Since?—In Massachusetts there have been several malaria peaks. One was associated with the returning Union Soldiers after the Civil War. During the not-so-gay 90's the Spanish-war veterans brought back a new crop from Florida and Cuba. During the first 40 years of this century there have been sporadic outbreaks though the level of reports remained low: since 1941 there has been an increase. What may happen in this and other northern states when our army returns from all the malarious regions of the earth is anybody's pessimisitic guess.

GETTING, V. A. Malaria in Massachusetts. New Eng. J. Med. 230, 12:350 (Mar. 23), 1944.

Estimating Caries Prevalence—Having the kind of mind that goes blank at the first glimpse of a formula involving the square root of *p d q* over *b v d*, I can report here only that this paper seems to be the kind that should be read by anyone who proposes to think about, or discuss, or do something about the problem of dental caries.

KNUTSON, J. W. An Index of the Prevalence of Dental Caries in School Children. Pub. Health Rep. 59, 8:253 (Feb. 25), 1944.

War-Working Women—Here are four good papers on specific hygienic problems posed by the large scale influx of women into industry, a series which will prove useful to health workers who may be directly or even remotely concerned with industrial health.

KRONENBERG, M. H. Working Conditions for Female Employees (and three related papers). J.A.M.A. 124, 11:677 (Mar. 11), 1944.

Chiefly for the Internationally Minded—Some of the reasons why the health organization of the late League of Nations failed to tick in the hearty manner its originators hoped for are recounted in this introduction to a dissertation upon future international public health administrative possibilities.

MACKENZIE, M. D. A Study of the Potentialities of International Collaboration in Medicine in the Post-War World. J. Roy. Inst. Pub. Health & Hyg. 7, 3:66 (Mar.), 1944.

North of the Border—If and when (Canadian) health insurance becomes operative, prognosticates this health official, public health will have received a most encouraging stimulus. He gives the reasons for his belief.

MCCANN, J. J. Health Insurance from the Public Health Standpoint. Canad. Pub. Health J. 35, 2:59 (Feb.), 1944.

How Many Medicos?—Counting medical noses is not the best way of estimating available medical resources, says this writer. Though physicians seldom formally retire until they have achieved an advanced age, the number of patients a physician sees declines steadily after age 40. A series of formulae are offered for measuring physician resources of a community.

PENNELL, E. H. Location and Movement of Physicians—Methods for Estimating Physician Resources. Pub. Health Rep. 59, 9:281 (Mar. 3), 1944.

Have You Seen Influenza B?—Seven researchers, aided and abetted by seven different benefactors, studied the influenza B virus and obtained some outstanding electron micrographs which reveal certain differences between that virus and influenza A. They learned a lot more about influenza B, which you can add to your store of knowledge by reading the paper.

SHARP, D. G., *et al.* Isolation and Characterization of Influenza Virus B (Lee Strain). J. Immunol. 48, 2:129 (Feb.), 1944.

New and Quite Russian—Do you know what a phytoncide is? A phytoncide is a volatile substance produced by plants, and having bactericidal and protistocidal properties. Freshly macerated onion or garlic gives off phytoncidal fumes which will kill yeast cultures and frog's eggs—among other living things. Now that you have been let into the secret, you'll have to read four papers to learn about the practical applications of this phenomenon, or you can turn to *Time* magazine—43, 11:40 (Mar. 13), 1944—for a curt, clear, and concise account.

TOKIN, B. Effect of Phytoncides upon Protozoa, (and) KOVALENOK, A. Action of Phytoncides upon Infusoria, (and) TOROPTSEV, I. Effect of Phytoncides upon Rabbits, (and) The Use of Phytoncides in the Treatment of Infected Wounds. Am. Rev. Soviet Med. 1, 3:237 (Feb.), 1944.

Planned Hunger—Though it may give you a case of the creeping meemies, you should read this account of the dreadful " disease of starvation " which decimated the refugee camps of Spaniards in unoccupied France. The daily diet of 1,100 calories was derived chiefly from pumpkins, cabbage, and carrots.

ZIMMER, R., *et al.* The Nutritional Situation in the Camps of the Unoccupied Zone of France in 1941 and 1942 and Its Consequences. New Eng. J. Med. 230, 11:304 (Mar. 16), 1944.

ASSOCIATION NEWS

SECOND WARTIME PUBLIC HEALTH CONFERENCE AND
SEVENTY-THIRD ANNUAL BUSINESS MEETING
AMERICAN PUBLIC HEALTH ASSOCIATION
New York, N. Y., October 3–5, 1944
Headquarters: Hotel Pennsylvania

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Charles F. Bodecker, D.D.S., 630 W. 168th St., New York 32, N. Y., Professor of Dentistry, Columbia University

Alonzo Garcelon, D.D.S., State House, Augusta, Me., Director, Div. of Dental Health, Bureau of Health

Ray A. Jacobson, D.D.S., 2404 Midway Blvd., Wausau, Wis., Director of School Health for Wausau Schools, Board of Education

Ewing C. McBeath, M.D., D.D.S., 630 W. 168th St., New York, N. Y., Professor of Dentistry, Columbia University

Charles A. Sweet, D.D.S., 2940 Summit St., Oakland 9, Calif., Chairman, California State Council on Dental Health

Fannya Zacharoff, D.D.S., Woodridge, N. Y.

Unaffiliated

Charles H. Crownhart, 917 Tenney Bldg., Madison 3, Wis., Sec., State Medical Society of Wisconsin

James M. Cunningham, M.D., Bureau of Mental Hygiene, State Health Dept., Hartford, Conn., Director

Laurence A. Fagan, 142 Allen Place, Hartford, Conn., Business Manager, State Dept. of Health

Morris Hinenburg, M.D., 555 Prospect Place, Brooklyn, N. Y., Exec. Director, The Jewish Hospital

Ruth H. Monroe, Station A, Box K, State Dept. of Health, Hartford, Conn., Chief, Div. of Licensure and Registration

V. C. Morgan, 4706 S.E. 43rd Ave., Portland, Ore., State Sanitarian, State Board of Health

J. Allen Scott, D.Sc., Dept. of Prev. Med., Univ. of Texas, Galveston, Tex., Assoc. Professor

Margaret P. Stimmel, M.S., 416 Locust, Fort Collins, Colo., Instructor in Bacteriology, Colorado State College of A. & M.

Russell W. Strandtmann, M.S., Medical College, Galveston, Tex., Asst. Professor of Entomology, Dept. of Preventive Medicine and Public Health

Dorothy Sutherland, 270 Union Ave., Rutherford, N. J., Editor of R. N. A Journal for Nurses

Allan C. Thurman, M.D., M.P.H., 1737

Cornell Circle, Salt Lake City, Utah, Director, Crippled Childrens Div., State Dept. of Health

O. Dorothy Yeakel, Box 264, Hudson Falls, N. Y., Exec. Sec., Washington County Tuberculosis and Public Health Committee

NATIONAL HEALTH HONOR ROLL AWARDS FOR 1943

Fifty-three communities have been granted awards in the National Health Honor Roll for 1943, according to a recent announcement by the sponsoring agencies, the United States Chamber of Commerce and the American Public Health Association. This recognition for progress in community health protection has been made on the basis of *Evaluation Schedules* submitted during March and April, 1944, and covering the various health activities throughout the year 1943.

The cities which attained the 1943 National Health Honor Roll are:

Baltimore, Md.
Detroit, Mich.
Evanston, Ill.
Greenwich, Conn.
Hackensack, N. J.
Hartford, Conn.
Houston, Tex.
Jackson, Mich.
La Salle-Peru-Oglesby, Ill.
Little Rock, Ark.
Madison, Wis.
Milwaukee, Wis.
Newark, N. J.
Newton, Mass.
Pasadena, Calif.
Peoria, Ill.
Racine, Wis.
Reading, Pa.
Rochester, Minn.
San Jose, Calif.
Schenectady, N. Y.
Stamford, Conn.

The counties which attained the 1943 National Health Honor Roll are:

Allegan County, Mich.
Arlington County, Va.
Austin-Travis County, Tex.
Barry County, Mich.
Calhoun County, Mich.
Coahoma County, Miss.
Davidson County, Tenn.
Dickinson County, Mich.
Eaton County, Mich.
El Paso City-County, Tex.
Fayette County, Ky.
Forsyth County, N. C.
Gibson County, Tenn.
Glynn County, Ga.
Ingham County, Mich.
Jackson County, Ore.
Jones County, Miss.
Lauderdale County, Miss.
Leflore County, Miss.
Los Angeles County, Calif.
Louisville-Jefferson County, Ky.
Madison County, Ky.
Mason County, Mich.
Memphis-Shelby County, Tenn.
Menominee County, Mich.
Midland County, Mich.
Saginaw County, Mich.
Santa Barbara County, Calif.
Spartanburg County, S. C.
Van Buren County, Mich.
Washington County, Miss.

Appropriate plaques will be forwarded to the communities shortly after June 1. Prior to this date interpretative letters discussing the details of individual programs will be forwarded to each community. The cancellation of the 1944 annual meeting of the United States Chamber of Commerce, scheduled originally for the first week of May, has necessitated a change in the usual custom of presenting the awards on this occasion. The American Public Health Association will give public recognition to the winning communities at the annual meeting in New York City the first week in October.

Evaluation Schedules showing the annual health inventory for 1943 were received from 190 communities.

The National Health Honor Roll is financed jointly by the W. K. Kellogg Foundation and the Metropolitan Life Insurance Company.

EMPLOYMENT SERVICE

The Association Employment Service seeks to bring to the attention of appointing officers the names of qualified public health personnel and to act as a clearinghouse on employment. This is a service of the Association conducted without expense to the employer or employee.

From the registry of persons available, selected announcements are published from time to time. Appointing officers may obtain lists of all registrants on request.

Address all correspondence to the Employment Service, American Public Health Association, 1790 Broadway, New York 19, N. Y.

POSITIONS AVAILABLE

Wanted: A physician trained in tuberculosis to assume administrative control of the Bureau of Tuberculosis in an eastern city of 200,000 population. Salary $4,500–$5,031 plus cost of living adjustment. Address Box B, Employment Service, A.P.H.A.

Sanitarian wanted: Preferably with Bachelor's degree or engineering degree, plus public health experience or training. Must have own car. Applicant with lower qualifications will be offered an opportunity to take a short, free indoctrination course. Salary $1,920 per year with travel allowance of $50 per month, if qualified. Apply Dist. Dept. of Health, No. 6, Central Office, Newberry, Mich., Dr. Franklin.

Wanted: Pediatrician to supervise medical care of children at cerebral palsy center being established by private institution in coöperation with Illinois Division of Services for Crippled Children. Salary commensurate with experience and training. For further information write Lawrence J. Linck, Director, Division of Services for Crippled Children, 1105 So. Sixth St., Springfield, Ill.

Wanted: Public health physicians in Texas. George W. Cox, M.D., State Health Officer, Austin, Tex.

Hawaiian Territorial Board of Health seeks trained engineer to supervise rodent plague control program. Salary range from $331.67 to $398.33 per month subject to retirement deductions plus bonus. Position under Territorial civil service system with classification of P-4. For further details address A.P.H.A. Employment Service.

Wanted: Physical therapist by Crippled Children's Division. Should be graduate of a school of nursing or of college, with a major in physical education or science; have completed a course in physical therapy; should have had experience in physical therapy, preferably with children. Write for application blank to Merit System Council, 416 Henry Building, 309 S.W. 4th Ave., Portland 4, Ore.

Psychiatric case worker desired for mental hygiene clinic, Department of Health, Peoria, Ill.

Senior Sanitarian, Alaska Health Department. Minimum requirements 2 years college, 6 months public health course, 2 years' experience. Two additional years' experience acceptable instead of each year college. Monthly salary $235–$265. Mary B. Pool, Alaska Merit System, Juneau.

Michigan announces civil service positions now open for orthopedic public health nurse, Grades II and III classes with the Michigan Crippled Children's Commission. Salary range: Grade II $230 to $270 per month; Grade III $280 to $340 per month. Grade II not under 23, Grade III not under 25. Must have completed course in orthopedic nursing or physical therapy in approved school. For Grade III position a full-time course of at least 9 months' duration is required. Must have 3 years' experience in public health nursing, one year of which shall have been in supervisory capacity. For Grade III position one additional year of nursing and one additional year of supervisory experience required. Eligibility for certificate in public health nursing and registration as a nurse in Michigan. For further information write Michigan Civil Service Commission, 310 No. Grand Ave., Lansing 4, Mich.

Wanted: Sanitary engineer or chemist to assist in stream pollution survey and later in study of sewage treatment. Should be qualified to perform chemical and bacteriological analyses of water and sewage and chemical analyses of industrial wastes. Nine months employment with possibility of indefinite continuation, particularly if person is willing to do some other types of analytical work, including coal analysis. Salary $175–$250 per month depending on qualifications.

Women considered. Address communications to Prof. Gilbert H. Dunstan, Dept. of Sanitary and Public Health Engineering, University of Alabama, Box 1996, University, Ala.

Industrial Hygiene Toxicologist. Calls for person of chemical or chemical engineering background. Position, supervising of chemical work of industrial hygiene service and industrial hygiene laboratory; designing special apparatus for field studies on occupational disease problems; conducting field and laboratory analyses of toxicological exposures in industry; keeping records, interpreting results and preparing records. Requirements, knowledge of chemical laboratory methods and equipment; procedures for qualitative and quantitative analysis of organic and inorganic chemistry; knowledge of chemical methods of determining toxic materials in industry; familiarity with petrographic methods of mineralogical analysis. Immediate temporary appointment will be made, to be followed later by civil service examination to determine permanent status. Salary $2,900 base, plus $100 a year war adjustment, or total of $3,000 per year. Travel expenses also allowed. Must be U. S. citizen. Resident of any state may apply. Write J. Lynn Mahaffey, M.D., Director of Health, State Department of Health, Trenton 7, N. J.

New Mexico Department of Public Health announces examinations to be held for the following positions:

Position	*Monthly Salary Range*
Director of Public Health Laboratories	$300–$400
Senior Bacteriologist	175– 225
Senior Serologist	175– 225
Supervisor of Laboratory Maintenance	150– 175
Senior Assistant Bacteriologist	145– 175
Senior Assistant Serologist	145– 175
Junior Bacteriologist	115– 135
Junior Serologist	115– 135

Residence in the state not required. Persons interested may make application by May 15, to the Merit System Supervisor, Box 939, Santa Fe, N. M.

Wanted: Health Commissioner, combined Health District, Delaware, Ohio. Model organization, University community. Salary $3,600 plus travel. Address: George T. Blydenburgh, M.D., Deputy Health Commissioner, Delaware, Ohio.

Wanted: Public Health Nurse. Salary $175 per month and full maintenance, plus $25 per month for car expense. Must furnish own car. Write Paul D. Crimm, M.D., Director Boehne Tuberculosis Hospital, Evansville 12, Ind.

City of 70,000, southeastern U. S., seeks qualified health commissioner between the ages of 30 and 45, draft exempt. Salary $4,500 plus auto allowance of $300 per year. **Box V,** Employment Service, A.P.H.A.

Assistant Sanitarian in well established Ohio department of health. Minimum experience 2 years required. Merit system prevails. Salary $1,800–$2,400. Write **Box K,** Employment Service, A.P.H.A.

Wanted: Bacteriologist to conduct virus laboratory in the Laboratory Section of the Health Division, City of St. Louis. Applicant must have graduate degree with research and practical experience in virology. Salary range from $220 to $360 a month, depending upon ability. Position under Civil Service. Write **Box W,** Employment Service, A.P.H.A.

Wanted: Statistical clerk, preferably with college degree and experience in health education, to study and analyze vital statistics in suburban and rural county adjacent to Washington. Special emphasis on relation to health department services and participation in Health Honor Roll. Address V. L. Ellicott, M.D., Dr.P.H., Montgomery Co., Rockville, Md.

Wanted: Medical Social Worker for Dept. of Health, Peoria, Ill. Address Director Maternal and Child Health, Dept. of Health, Peoria, Ill.

Wanted: Physician in eastern city of 200,000 population as Director of Bureau of Maternal and Child Hygiene. Salary $4,500–$5,031, plus cost of living adjustment. Address **Box C,** Employment Service, A.P.H.A.

Wanted: A physician with venereal disease control experience to assume directorship of the Bureau of Venereal Diseases in a large northeastern city. Salary $4,500–$5,000 per year, plus cost of living adjustment and travel allowance. **Box E,** Employment Service, A.P.H.A.

Wanted: Physician (male), American citizen, draft exempt, trained in pediatrics, for a 3 year position as chief resident and research assistant in fine pediatric tuberculosis hospital, New York. Good salary and maintenance. Only one intensely interested in research need apply. Send full details of qualifications and photograph. **Box R,** Employment Service, A.P.H.A.

Wanted: X-ray technician to travel with portable x-ray unit taking chest x-rays at tuberculosis case finding clinics. Includes both industrial and school surveys. Salary $35 per week plus travel and maintenance when away from headquarters. Address **Box M**, Employment Service, A.P.H.A.

Wanted: Resident physician for plant in South America. Must have thorough knowledge of malaria, tropical medicine, and vector control. Must be eligible for licensure in British Colony. Address **Box H**, Employment Service, A.P.H.A.

Physician wanted as Director of Maternal and Child Health in western county health department. Preferably with training in pediatrics and venereology. Some venereal disease control work also. Man preferred but woman considered. Must be in good health. Salary $4,500 per year with car and expenses furnished. Position for duration of war. Address **Box S**, Employment Service, A.P.H.A.

Tuberculosis Association in large western city seeks a trained and experienced health education director, a director of medical social work, and a public health nurse supervisor. Attractive positions now open in agency with a dynamic program closely related to official groups. Address **Box D**, Employment Service, A.P.H.A.

U. S. Indian Service seeks physicians for service in the United States and Alaska. Address Office of Indian Affairs, Health Division, Merchandise Mart, Chicago 54, Ill. Application blanks will be furnished upon request.

Wanted: Competent, thoroughly trained bacteriologist, woman or draft exempt man, to take complete charge of splendidly equipped small industrial laboratory, Connecticut location, country environment, pleasant surroundings, excellent working and living conditions. This is a permanent post-war position. Write full details including minimum salary requirement to start in first letter. All letters including adequate vitae and photo will be promptly acknowledged. Write **Box A**, Employment Service, A.P.H.A.

St. Louis, Mo., Health Division, Industrial Hygiene Service, seeks two industrial hygienists, either engineers or chemists. Salaries $225 to $250 per month depending on qualifications and experience, plus travel allowances. Address Robert M. Brown, Public Health Engineer, 64 Municipal Courts Bldg., St. Louis 3, Mo.

Wanted: Medical technologists, also bacteriologist for 550 bed approved California hospital. Give full particulars and state salary desired. Address W. O. Brown, M.D., Kern General Hospital, Bakersfield, Calif.

Wanted: Medical technologist, woman, trained in bacteriology of milk and water, diagnostic cultures, routine blood chemistry and tissue work—paraffin and frozen sections. County position under Civil Service located in the East. Salary to be arranged. Write **Box L**, Employment Service, A.P.H.A.

Wanted: M.D., instructor in preventive medicine and public health, with interest particularly in biostatistics and industrial hygiene. Salary approximately $4,000. Write **Box T**, Employment Service, A.P.H.A.

Local Health Consultant, State of Connecticut. A competitive examination open to all citizens of the United States has been announced by the Personnel Department, State of Connecticut, Hartford. Position of local health consultant in the State Department of Health carries a salary of $5,100–$5,700 per annum. Requirements include medical degree, minimum of 5 years' employment (or public health degree and 3 years' employment). Persons interested should communicate with the Personnel Department, State Capitol, Hartford, Conn. Closing date May 31.

Public Health Nurses Wanted: Three staff positions available. Generalized program. Annual salary $2,220 to $2,400 plus travel for use of own car. Address Miss Lorilla Britell, Supervisor, King County Health Dept., County-City Building, Seattle 4, Washington.

FOR OTHER POSITIONS AVAILABLE WRITE EMPLOYMENT SERVICE, AMERICAN PUBLIC HEALTH ASSOCIATION, 1790 BROADWAY, NEW YORK 19, N. Y.

In view of the current active demand for trained and experienced persons in public health, it is suggested that prospective employers communicate directly with the Employment Service, American Public Health Association, 1790 Broadway, New York 19, N. Y., for up-to-date lists of applicants.

POSITIONS WANTED

ADMINISTRATIVE

Physician, age 37, M.D. Iowa, Dr.P.H. Harvard, specializing in tuberculosis, seeks position as medical director of a sanatorium or a state bureau of tuberculosis. Exempt from military service. **A-476**

Physician, M.D. University of Arkansas, M.P.H. Harvard, experienced as county health officer. Age 35. Will consider position as county or city health officer or director of a bureau. **A-506**

Physician, M.D. Yale, with private practice industrial medicine. Age 39 and draft exempt. Seeks opportunity as public health physician. **A-505**

Woman physician, experienced in public health education and school health service administration and supervision, seeks full- or part-time position, preferably southeastern New York State. **A-511**

HEALTH EDUCATION

Woman with background of health education and public health nursing, experienced as teacher, supervisor, and writer, seeks teaching position of responsibility. **H-507**

LABORATORY

Research bacteriologist. Unusually trained and experienced woman bacteriologist and serologist now occupying responsible position in state laboratory seeks research work of permanent character. **L-468**

Water chemist, bacteriologist, M.S. degree in Sanitary Chemistry. Age 36, draft exempt. Eight years' experience in state laboratory working on water, milk and sewage. Prefers Midwest or Pacific Northwest location. **L-469**

ENGINEER

Well qualified public health engineer seeks responsible position in New York metropolitan area. **E-480**

MISCELLANEOUS

Public Health Nurse. B.S. in nursing, William and Mary College, age 53, seeks position as coördinator of public health nursing, educational director, or director student nurse public health program. Prefers Middle Atlantic States. **M-452**

NEWS FROM THE FIELD

UNIVERSITY OF MICHIGAN INSTITUTE ON DENTAL HEALTH ECONOMICS

The School of Public Health of the University of Michigan has announced plans for an Institute on Dental Health Economics to be held at Ann Arbor throughout the week of June 26 to July 1.

It is the purpose of this Institute to bring together a group of outstanding leaders in the field of dental health under the chairmanship of Dr. Kenneth A. Easlick, Associate Professor of Public Health Dentistry, in order that they may share their experiences and pool their thoughts on the improvement of the dental health of the American people. It is planned to review briefly the social and economic background of health problems, and against this setting to develop a comprehensive understanding of the dental problem. Minimum standards of dental health service will be considered and concise information will be presented to assist in the development of a program to solve the dental problem at this level of standards. It is intended that the work of the Institute will culminate in concrete proposals for a dental health program designed to meet the challenging needs which are known to exist.

The following are among the speakers who will participate in the formal program:

R. C. Williams, M.D., Director, Division of Medical Services, U. S. Public Health Service
John W. Knutson, Dental Surgeon, U. S. Public Health Service
Henry Klein, Senior Dental Officer, U. S. Public Health Service
Nathan Sinai, Dr.P.H., Professor of Public Health, University of Michigan
Harold Y. McClusky, Ph.D., Professor of Educational Psychology, University of Michigan
Melvin L. Dollar, Public Health Economics, University of Michigan
Marcus L. Ward, D.D.S., Jonathan Taft Professor of Dentistry, University of Michigan
Don W. Gullett, D.D.S., Secretary, Canadian Dental Association
Harold Hillenbrand, D.D.S., Associate Editor, *Journal of the American Dental Association*
John Oppie McCall, D.D.S., Director, Guggenheim Dental Clinic, New York, N. Y.
John T. O'Rourke, D.D.S., Dean, School of Dentistry, University of Louisville
Walter H. Philips, D.D.S., Director, Dental Division, Detroit Department of Public Welfare
R. M. Walls, D.D.S., Member of Committee on Economics, American Dental Association
J. M. Wisan, D.D.S., Director, Dental Health Division, New Jersey State Department of Health

Because of the nature and purpose of the Institute registration must be limited to fifty members. Although an attempt will be made to obtain a geographic distribution of the applicants, primary consideration will be given to the order in which applications are received. The registration fee will be $10. Requests for application blanks should be sent promptly to Dr. Kenneth A. Easlick, School of Public Health, Ann Arbor, Mich.

MEETING ON PUBLIC HEALTH BROADCASTS

The Institute for Education by Radio has been held annually for fourteen years under the auspices of Ohio State University. Last year for the first time a meeting on the subject of public health broadcasts was included. David Resnick, Director of Public Relations of the National Society for the Prevention of Blindness, presided and among the participants were Daniel C. McCarthy, of the National Tuberculosis Association, Dr. E. R. Coffey, U. S. Public Health Service, Thomas C. Edwards, Office of the Coördinator of Inter-American

Affairs, Dr. Iago Galdston, New York Academy of Medicine, Dr. Robert G. Paterson, Ohio Public Health Association, and Muriel Steward, Hennepin County Tuberculosis Association. Now it is announced that another section meeting on public health broadcasts will be part of the Fifteenth Institute for Education by Radio, to be held in Columbus, Ohio, May 5–8. This session is scheduled for Saturday evening, May 6. Mr. Resnick is Chairman and Dr. Coffey is discussion leader. Directors of health education from governmental and voluntary health agencies and executives of broadcasting networks and local radio stations will participate in the discussions.

DR. PARRAN REAPPOINTED SURGEON GENERAL

Upon nomination by President Roosevelt, Thomas Parran, M.D., who for eight years has been Surgeon General of the U. S. Public Health Service, was recently nominated for a third term of four years and was immediately confirmed by the Senate.

CHILDREN'S BUREAU COMMISSION ON CHILDREN IN WARTIME

Ruth Houlton, R.N., Director of the National Organization for Public Health Nursing represented the American Public Health Association at the meetings of the Children's Bureau Commission on Children in Wartime on March 17 and 18 in the absence of Dr. Atwater, and reports as follows:

The Children's Bureau Commission on Children in Wartime appointed by Katherine Lenroot, Chief of the Children's Bureau, in February, 1942, when it met to adopt A Children's Charter in Wartime met again in Washington, D. C., on March 17 and 18, to review its activities and to consider goals for the future.

A large proportion of the more than 75 members of the Commission representing many official and voluntary agencies interested in the health and welfare of children attended the meeting, and participated in the discussion. Physician, dentist and nurse members of the Commission include:

Fred L. Adair, M.D., American Committee on Maternal Welfare
Frederick H. Allen, M.D., Philadelphia Child Guidance Clinic
Reginald M. Atwater, M.D., American Public Health Association
Leona Baumgartner, M.D., New York City Department of Health
Alice Drew Chenoweth, M.D., Kentucky State Department of Health
Paul B. Cornely, M.D., Howard University, Washington, D. C.
Nicholson J. Eastman, M.D., Johns Hopkins Hospital
Franklin P. Gengenbach, M.D., President, American Academy of Pediatrics
Henry F. Helmholz, M.D., The Mayo Clinic
Ruth Houlton, R.N., National Organization for Public Health Nursing
Emory W. Morris, D.D.S., W. K. Kellogg Foundation
Ellen C. Potter M.D., New Jersey State Department of Institutions and Agencies
Mabel K. Staupers, R.N., National Association Colored Graduate Nurses
George S. Stevenson, M.D., National Committee for Mental Hygiene
Felix Underwood, M.D., State Health Officer, Mississippi

Leonard W. Mayo, Dean, School of Applied Social Sciences, Western Reserve University, was reëlected Chairman.

An interesting feature of the meeting was a panel of 12 boys and girls who discussed, "Next Steps in Planning for Children and Youth." The discussion leader was C. B. Loomis, head, Department of Sociology, Piedmont College, Georgia. Participants came from all parts of the country and included college and high school students as well as workers in textile and defense industries. Among them were a Chinese girl and a Negro boy and girl. In the President's Proclamation of May 1 as Child Health Day, youth forums of this kind are encouraged.

The "Goals for the Future as We Go from War to Peace" adopted by the Commission include the following emphases on health:

Extension of health service and medical care to assure access to adequate care for all mothers and children

Regulation of child labor and safeguarding of youth in wartime employment

Safeguarding family life in wartime during demobilization and in the post-war period

Review and revision of legislative safeguards and standards relating to children in preparation for the 1945 sessions of the legislatures, in the light of these goals for children

Sharing of the public responsibility for the health, education, and welfare of children by federal, state, and local authorities, with recognition of the primary responsibility of the state and local units, the importance of providing federal funds for local services through grants-in-aid to appropriate State agencies, and with the removal of residence restrictions in the selection of personnel for such programs

Provision for the training of professional personnel required for services for children and youth and for the preparation of volunteers to assist in rendering such services

Increased opportunities for youth to share in the planning and development of programs—local, state, and national, and international—for the benefit of youth

Education of parents, youth, and all citizens concerning the importance of providing full security and opportunity for children for the sake of their own happiness and well-being and for the future of the nation

U. S. PUBLIC HEALTH SERVICE REORGANIZES THE INDUSTRIAL HYGIENE DIVISION

The reorganization of the Public Health Service effected by action of the 78th Congress became operative on December 30, 1943. Under the new plan of administration, the present structure of the Industrial Hygiene Division, with the exception of the Research Section, becomes a Division of the Bureau of State Services. The Research Section remains in the National Institute of Health and will be known as the Industrial Research Laboratory.

Medical Director J. G. Townsend, who heads the Division, has announced the following personnel in charge of the Sections and Units which comprise the reorganized Industrial Hygiene Division:

Dermatoses Section (formerly the Dermatoses Investigation Section) — Medical Director Louis Schwartz

Field Operations Section (formerly the States Relations Section)—Senior Sanitary Engineer J. J. Bloomfield

Medical Unit—Surgeon W. C. Dreessen

Engineering Unit — Sanitary Engineer (R) Harry E. Seifert

Statistical Unit—Principal Statistician W. M. Gafafer

Chemical Unit—Senior Chemist F. H. Goldman

INTERNSHIPS IN PUBLIC HEALTH

The following announcement is quoted from the issue of *New York State Health News* for March 6:

"The State Department of Health will consider applications from young physicians interested in securing training in the field of public health. Applicants must possess certain basic qualifications among which are United States citizenship, graduation from a medical school approved by the American Medical Association, and license to practise medicine in New York State or eligibility to take the examination to obtain such a license.

"The training consists of 6 to 12 months' field experience followed by an academic year at a postgraduate school of public health.

"Physicians interested in this training should write to the State Department of Health, Albany 1, N. Y., or communicate with the nearest district state health officer. If the applicant desires to attend school this fall, his field training must begin in the near future. Immediate application is advised."

MT. SINAI HOSPITAL PLANS POST-WAR EXPANSION

Mt. Sinai Hospital, New York, N. Y.,

has announced the appointment of George Baehr, M.D., who recently has served as chief medical officer of the Office of Civilian Defense, and as Medical Director in the U. S. Public Health Service (R), as Director of Clinical Research. He will coördinate the hospital's clinical research activities, the work of the laboratories, and the development of the use of the hospital's facilities.

Isidore Snapper, M.D., formerly of Amsterdam, Netherlands, and Peking, China, was appointed director of graduate medical education for the hospital.

PUERTO RICO PUBLIC HEALTH ASSOCIATION

At its Annual Meeting held in February, the Puerto Rico Public Health Association elected the following new officers:

President—Oscar Costa-Mandry, M.D.
President-elect—Jose N. Gandara, M.D.
Vice-President—Ezequiel Martinez-Rivera, M.D., M.S.P.H.
Secretary—Guillermo Arbona, M.D., M.P.H.
Treasurer—Celia Guzman, R.N., M.A.
Representative to A.P.H.A. Governing Council—Pablo Morales Otero, M.D.

PERSONALS

Central States

JOHN K. ALTLAND, M.D., M.S.P.H.,† Hastings, Mich., was to resume his position as Director of the Barry County Health Department on March 16.

JAMES A. CAMPBELL, M.D., Health Director of Scott County, Kan., has been appointed to a similar position in Mason County.

B. RUSSELL FRANKLIN, C.P.H.,† Chief Sanitarian of the Lorain County District Department of Health, Oberlin, Ohio, has been granted a leave of absence for the duration to accept a commission as Lieutenant (jg) in the U. S. Navy.

FRED H. RHODES, M.D., has been appointed Health Officer of Washington County, Kan.

ORLIN P. WOOD, M.D., Marysville, Kan., has been appointed Health Officer of Marshall County.

RALPH W. G. WYCKOFF, PH.D.,† has recently joined the staff of the University of Michigan School of Public Health, Ann Arbor, Mich., to work in the virus laboratory on biophysical methods.

Eastern States

L. VAND. CHANDLER,* Health Officer of Hackensack, N. J., was recently cited by the Hackensack Chamber of Commerce for his work as Chairman of the Permanent War Finance Committee during the 4th War Loan campaign. According to the announcement, Mr. Chandler through his own efforts sold $530,000 in War Loan Bonds.

N. STANLEY LINCOLN, M.D.,† who has been Superintendent of the Mt. Morris Tuberculosis Hospital, Mt. Morris, N. Y., for the past 9 years, has been transferred by the Division of Tuberculosis of the New York State Department of Health to the position of Superintendent of the Hermann M. Biggs Memorial Hospital, Ithaca, N. Y., succeeding JOHN K. DEEGAN, M.D.,† who resigned to enter military service.

JANICE RAFUSE, M.D.,† is now a member of the staff of the Division of Child Hygiene of the Massachusetts Department of Public Health, Boston, Mass.

ARTHUR M. STOKES, M.D., a member of the staff of the Homer Folks Tuberculosis Hospital, Oneonta, N. Y., has been transferred by the Division of Tuberculosis, New York

* Fellow A.P.H.A.
† Member A.P.H.A.

State Department of Health, to become Superintendent of Mt. Morris Hospital at Mt. Morris.

JAMES WAILS, M.D., M.P.H.,* has been appointed Commissioner of Health for the City of Worcester, Mass. Prior to this appointment Dr. Wails was Director of the Nashoba Health Unit, Ayer, Mass.

HARRY C. WYER, M.D., who was formerly a Lt. Col. in the United States Army and Professor of Preventive Medicine and Military Tactics at the Boston University Medical School, has been appointed Health Officer of the South Metropolitan District of the Massachusetts Department of Health, Boston, Mass.

Southern States

THOMAS P. ANDREWS, M.D., has resigned as Health Officer of Brownsville, Tex.

JAMES A. MCCALLUM, M.D., C.P.H.,† Centerville, Md., has been appointed Health Officer of Queen Annes County, succeeding DR. WILLIAM R. WILLARD,† Hagerstown, Md.

WATSON S. RANKIN, M.D.,* Director of the Hospital and Orphan Sections of the Duke Endowment, Charlotte, N. C., has been elected Chairman of the Charlotte Board of Health.

LEWIS C. ROBBINS, M.D., C.P.H.,† P.A. Surgeon, U. S. Public Health Service Reserve, formerly Health Officer of Wichita Falls, Tex., was presented with the Distinguished Service Award of the United States Junior Chamber of Commerce on January 14. Dr. Robbins was cited for his successful conduct of a venereal disease control campaign that he instituted in Wichita Falls. He is now associated with the Public Health Department in San Antonio, Tex.

FRANCES C. ROTHERT, M.D.,* recently Regional Medical Consultant for the U. S. Children's Bureau in New Orleans, has resigned from the Children's Bureau and has been appointed Acting Director of Maternal and Child Health in the Arkansas State Board of Health, Little Rock.

ELVIN L. SEDERLIN, M.D.,† Bismarck, N. D., has resigned as acting director of the Venereal Disease Control Division of the North Dakota State Health Department in order to accept a position as Assistant Health Director of Baltimore County, Md.

HARRY B. SMITH, M.D., formerly of Jacksonville, Fla., and now field consultant in the Division of Venereal Disease Control in the Maryland State Department of Health, has been appointed senior medical supervisor in the Bureau of Venereal Disease of the Baltimore City Department of Health, Md.

PROFESSOR CLAIR E. TURNER, DR.P.H., Sc.D.,* has been appointed Public Health Education Officer in the Health and Sanitation Division of the Office of the Coördinator of Inter-American Affairs, in which capacity he left for Brazil, Chile and Peru in March.

HERBERT T. WALWORTH, M.S.,* formerly Director of the Division of Industrial Hygiene, Montana Department of Public Health, Helena, Mont., has resigned to become Industrial Engineer of the Tennessee Department of Public Health, Nashville, Tenn.

CHARLES A. WYATT, M.D., Marshall, Tex., has been appointed Health Officer of Harrison County, Tex.

Western States

ALBERT D. BREWER, M.D., has resigned as City-County Health Officer of Bozeman and Gallatin County, Mont., to become staff physician at the Montana State Tuberculosis Sanitarium, Deer Lodge.

* Fellow A.P.H.A.
† Member A.P.H.A.

American Journal of Public Health
and THE NATION'S HEALTH

Volume 34 June, 1944 Number 6

Epidemic Keratoconjunctivitis

Correlation of Epidemiologic Data and Results of Serum Virus Neutralization Tests*

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DURING the course of the investigation of an extensive outbreak of epidemic keratoconjunctivitis in a large manufacturing plant in Schenectady, N. Y.,[1] opportunity was furnished to study further the significance of the virus neutralization test described by Sanders and his coworkers.[2] The purpose of this paper is to present the results of tests performed on sera from the Schenectady area, as well as previously unpublished data on a group from New York City. Although the number of persons studied was not large, it is felt that the findings are of sufficient significance to warrant presentation.

The outbreak in Schenectady was definitely established as one of epidemic keratoconjunctivitis upon clinical grounds. Most of the cases presented the typical signs and symptoms of the disease noted by other investigators.[3] Briefly, these included an initial hyperemia and follicular hyperplasia of the palpebral conjunctiva, without purulent discharge and with considerable edema of the periorbital tissues. Tearing and the sensation of foreign body in the eye were common. Later there was involvement of the bulbar conjunctiva, frequently with chemosis. Swollen and tender preauricular lymph nodes appeared commonly on the 3rd day of illness in practically all patients, and subepithelial corneal opacities developed in 87 per cent of the study sample. Approximately 4 per cent of the plant population developed clinical evidence of the disease during the course of the outbreak.

Attempts were made by Habel[4] to isolate the virus of epidemic kerato-

* Presented at a Joint Session of the Epidemiology and Laboratory Sections of the American Public Health Association at the Seventy-second Annual Meeting in New York, N. Y., October 13, 1943.

NOTE: The laboratory phase of this study has been aided by grants from William R. Warner & Company, and from the John and Mary R. Markle Foundation.

conjunctivitis from the conjunctival scrapings of several acute cases in the Schenectady outbreak by means of tissue culture and intracerebral inoculation into mice. Although a number of the mice so treated developed a mild clinical illness on the 5th day after inoculation, a strain of the virus which could be maintained indefinitely was not obtained. In the study of this disease in New York City, Braley [5] had the same experience in attempting to isolate the virus; namely, that the mice showed transient symptoms but recovered. In this instance, however, additional data of significance were obtained. Approximately 100 of his mice, showing in most instances clinical evidence of the disease but surviving primary inoculation with conjunctival scrapings from cases of epidemic keratoconjunctivitis, were challenged by graded doses of the mouse-adapted strain of virus previously isolated by Sanders. Whereas in an equal number of 100 control mice death occurred in all tested dilutions through 10^{-6}, the challenged mice were protected in dilutions of 10^{-6}, 10^{-5}, and 10^{-4}, and succumbed only to a 10^{-3} assault dose. Thus, while the injection of human conjunctival scraping did not produce a transmissible agent, protection was afforded against the previously demonstrated virus.

The technic employed in performing this neutralization test has been fully described elsewhere.[2] All that need be said here is that constant amounts of serum were mixed with tenfold dilutions of the virus, and the mixtures incubated for 1 hour at 37° C., and then placed in the icebox for 24 hours. Each serum virus mixture was injected intracerebrally into four Swiss mice. The titer of the serum as recorded in this paper represents the last dilution in which death occurred. Control mice uniformly died in all dilutions through 10^{-6}.

In order to avoid any possible personal bias in interpreting the results of these tests, sera submitted to the laboratory were identified by numbers only. Sera from 57 persons in the Schenectady area and from 46 in New York City, comprising a total of 118 specimens, were studied in this manner. Specimens were obtained from patients with epidemic keratoconjunctivitis early in the course of their illnesses, during convalescence, and after recovery, as well as from contacts known not to have had any eye complaint. Likewise, a group of controls were included consisting of persons known not to have suffered from the clinical disease and without history of contact with it. Some of these control individuals had ocular conditions other than epidemic keratoconjunctivitis, including various bacterial conjunctivides and corneal ulcer. Sera in these various categories were submitted at random and not all in one category at one time.

The results of the tests performed are tabulated in Table 1, and the percentage positive presented graphically in Chart I. It should be emphasized that little significance can be attached to the finding of neutralization in the 10^{-5} dilution, since the accuracy of the test does not allow such fine distinction. However, test sera with titers of 10^{-4} or less may be considered significant in the demonstration of neutralizing antibodies.

It is evident that sera obtained during the first week of illness from patients with typical acute epidemic keratoconjunctivitis, who subsequently developed corneal opacities, show no neutralization. The same is true of the groups of control individuals studied. On the other hand, the sera of all convalescent cases (6–10 weeks after onset) and 40 per cent of sera from cases taken 5 months after onset of illness, showed definite neutralization. Of particular significance was the marked

TABLE 1

Extent of Neutralization to the Virus of Epidemic Keratoconjunctivitis Shown by Selected Sera

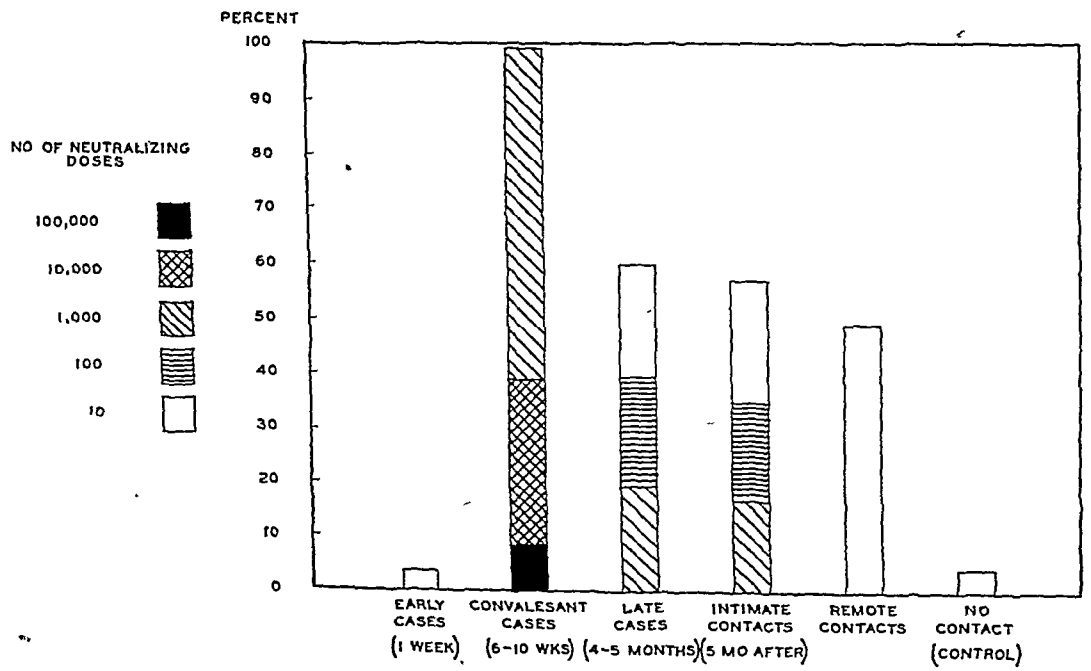
Titer of Serum	No. of Neutralizing Doses	Cases			Contacts		Control No Known E.K. or Contact	Total
		Early 1st Week	Convalescent 6–10 Weeks	Late 4–5 Months	Intimate (5 Months After Onset of Case)	Remote		
10^{-0}	0	30	..	4	7	4	28	73
10^{-1}	10	1	..	2	4	4	1	12
10^{-2}	100	..	..	2	3	..	..	5
10^{-3}	1,000	..	14	2	3	..	..	19
10^{-4}	10,000	..	7	..	..	..	..	7
10^{-5}	100,000	..	2	..	..	..	..	2
Total		31	23	10	17	8	29	118

rise in antibody titer shown by 15 of the patients tested during the first week of illness and then 6 to 10 weeks later. The sera of all these persons were negative on the first test, but on second test showed at least 1,000 neutralizing doses. Two of this group developed titers of 100,000 neutralizing doses.

The healthy contacts studied have been divided into two groups; namely, those with family or other intimate contact with the disease, including certain nurses and physicians handling large numbers of cases; and remote contacts including fellow plant workers or hospital personnel having no known direct contact with cases. The similarity of the findings in the group of late or recovered cases to those in the intimate contacts should be noted although the figures are too small to warrant definite

CHART 1

PERCENTAGE OF CERTAIN SELECTED SERA SHOWING NEUTRALIZATION TO THE VIRUS OF EPIDEMIC KERATOCONJUNCTIVITIS AS WELL AS THE TITER OF NEUTRALIZATION



conclusions. Both of these groups were examined about 5 months after onset of experience with the infection. Unfortunately, no sera from contacts were obtained during the period of early convalescence of the index case. One wonders whether such sera might not show higher levels of neutralizing antibodies.

Those intimate contacts with significant amounts of neutralizing antibodies in their sera deserve further comment. Of the 3 showing neutralization in the 10^{-4} dilution, or 100 neutralizing doses, one represents the plant ophthalmologist who handled the large majority of cases. The other 2 were intimate household associates of severe cases, who had nursed the patients during their acute illnesses. None of these persons gave a history of ever having conjunctivitis and careful examination of their eyes failed to show any evidence of epidemic keratoconjunctivitis or its residuals. Such a situation has a good precedent in equine encephalomyelitis, where laboratory workers handling the virus may develop high titers of neutralizing antibodies in their blood, without apparently having suffered from the disease.

The 3 persons exhibiting 1,000 neutralizing doses in their sera are of considerable interest since they are all from the same family of 4 resident members, in which the 4th member, the mother, suffered a typical case. These 3 individuals were studied in great detail, but no history of eye complaint nor evidence of epidemic keratoconjunctivitis on physical examination was uncovered. These three household contacts were employed at the plant where the outbreak occurred but the mother with the clinical disease rarely left home and never visited the plant. She was not aware of having had contact with any known case of epidemic keratoconjunctivitis. Two months after this initial test, or 7 months after the onset of the case, blood sera were again obtained from the members of this family. Significant neutralization, although in lower titer, was again found in serum from the patient and from 2 of the contacts, while serum from the third contact had become negative. (Results not included in table.) These findings suggest the possible existence of asymptomatic carriers of the virus.

SUMMARY AND CONCLUSIONS

Sera from cases of epidemic keratoconjunctivitis and their contacts, as well as from presumably normal control individuals and persons with other eye conditions, have been studied for the presence of neutralizing antibodies to the virus previously isolated from the conjunctival scrapings of cases of epidemic keratoconjunctivitis. It is felt that the data presented lend support to the conclusion that the virus isolated by Sanders is etiologically related to the disease. Although the number of healthy individuals studied was small, the evidence tends to confirm the possibility previously suggested [1] that a subclinical phase of the disease may exist.

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ACKNOWLEDGMENT — We should like to acknowledge the generosity of Dr. Alson E. Braley, Associate Professor of Ophthalmology, College of Physicians and Surgeons, in permitting the use of some of his clinical material.

The Uses of Penicillin

At the meeting of the American Philosophical Society in Philadelphia, Pa., April 20, Dr. Chester S. Keefer of Boston, who is in charge of civilian allocations of penicillin, summarized the utility of the new drug for a variety of conditions.

Confirming the great effectiveness of penicillin as recently reported in syphilis, Dr. Keefer stated that it is now the best remedy for controlling the gonococcus, meningococcus, and the staphylococcus and that it is effective for some of the streptococci and pneumococci. He said that it is also useful for tetanus, gas gangrene, diphtheria, some of the pneumonias, and the large series of infections caused by the organisms already named.

According to Dr. Keefer, the drug is not useful in influenza, typhoid and paratyphoid fevers, in tularemia, bubonic plague, cholera, whooping cough, tuberculosis, nor any known virus diseases. He stated that, when organisms ordinarily susceptible to the drug become seated on the heart valves, penicillin loses most of its curative power.

Epidemic Keratoconjunctivitis—Detroit Experience*

JOSEPH G. MOLNER, M.D., F.A.P.H.A., AND E. L. COOPER, M.D.

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REPORTS of epidemic keratoconjunctivitis have appeared in medical literature with increasing frequency since the early fall of 1941. Reference is made in these articles to the history of the disease and it is indicated that apparently the condition was recognized and originally reported by Fuchs.[1] Probably the first report of the occurrence of the malady in the United States was made by Hobson,[2] who reported 16 cases in a veterans' hospital in San Fernando, Calif. Increasing emphasis is given to the importance of the condition in this country in the reporting of 200 cases in San Francisco, Calif., by Hogan and Crawford.[3] One hundred and one cases out of 125 studied were reported in one shipyard in the City of San Francisco and 92 of these patients, or 75 per cent, developed opacities of the cornea. The high incidence of the disease in industrial plants and the frequency with which opacities of the cornea develop show evidence of creating a major problem in war production plants. The epidemic nature of the disease and incidence of opacities result in the loss of many man hours of work. The opacities of the cornea peculiar to epidemic keratoconjunctivitis result in permanent and semi-permanent disabling of employees engaged in work requiring acuteness of vision. These problems furnished the incentive for the Division of Preventive Medicine of the Surgeon General's office to call a conference of physicians and representatives of industry to discuss epidemic keratoconjunctivitis and the relationship of the disease to industry and the war effort.[4] The conference stimulated a great deal of interest in the incidence of the condition and its handicapping characteristics both to the individual and to industry.

In the City of Detroit in the early winter of 1942–1943 no such cases had been reported, although an occasional acute conjunctivitis of unknown etiology had been seen by ophthalmologists. However, the need for planning the control of epidemic keratoconjunctivitis in a large industrial city like Detroit became evident to representatives of industry and the local Health Department. To plan the control of a possible outbreak, representatives of industry, the State Department of Health, and the Detroit Department of Health made arrangements with the New York State Department of Health and the Medical Director of one of the larger industrial plants which was experiencing a major outbreak of epidemic keratoconjunctivitis to visit this latter organization and to acquire first-hand information about the clinical characteristics of the disease, epidemi-

* Presented at a Joint Session of the Epidemiology and Laboratory Sections of the American Public Health Association at the Seventy-second Annual Meeting in New York, N. Y., October 13, 1943.

ology, and recommended treatment procedures. Having had the benefits of the New York experience and the advice and guidance of the New York workers, the Detroit group laid its plans for the control of epidemic keratoconjunctivitis should the day arrive when cases of this disease would be reported in this area.

THE PLAN OF CONTROL

1. Epidemic keratoconjunctivitis was made a reportable disease with further provision that placarding of the case could be required at the discretion of the health officer.

2. Physicians, industrial nurses, first aid personnel of medical departments in industry, and industrialists were familiarized with the clinical characteristics of the disease, its mode of spread, and its handicapping features. To attain this, a series of conferences were held through the coöperation of the Wayne County Medical Society, the Detroit Ophthalmological Society, ophthalmologists, industrial physicians, and industrial nurses. Mimeographed information on the clinical characteristics of the disease, differential diagnosis, epidemiology, incidence of opacities, and the recommended treatment procedures were distributed for the use of these people.

Industry, in turn, circularized medical, nursing, first aid, and safety personnel with similar types of literature, and, in general, the administrative and executive staffs of industry were properly informed by their respective medical departments of the importance of the disease.

3. It became evident from recent reports in the literature and through conferences with the New York group that meticulous care and cleanliness were essential in the control of the spread of the disease, and that the "eye-to instruments (or fingers)-to-eye" route in eye clinics and physicians' offices represented the most important means of spreading the disease. For these reasons through the coöperation of the Wayne County Medical Society and the Detroit Ophthalmological Society, a diagnostic and treatment clinic was established by the Detroit Department of Health to which industry and local physicians had the privilege of sending their patients. This clinic was set up for the proper handling of communicable eye conditions. Industrial medical personnel and practising physicians were invited to bring in their own cases or to attend the clinic at their convenience, and benefit from the experience of seeing the communicable disease technic as applied in the eye clinic by public health personnel.

4. An approach was made to industry to establish in the eye rooms and the eye clinics in the plants a similar closed communicable disease technic. The attendants in the eye clinic were required to wear gowns and rubber gloves and to scrub meticulously between cases. All contaminated eye-room equipment, such as glass rods, eye spuds, forceps, or any other instruments were required to be sterilized between individual cases. Under this plan it was necessary to use sterilized individual eye droppers for individual cases and the glassware and equipment had to be cleaned and sterilized daily. A small contaminated table and a clean table were set up in each of the eye clinics with specific instructions to attendants to place all contaminated material only on the contaminated table. The arm rests were removed from the eye chairs and each patient was instructed upon entering the room to hold his belongings, lay nothing down, and to touch nothing in the room. A detailed sterile-eye-room procedure was outlined and posted in each of the eye rooms in the industrial plants, and copies of these procedures were given to the attendants

in the first aid division of the plants.

Although the plan has been recommended and adopted in certain plants of establishing a separate eye clinic for the diagnosis of keratoconjunctivitis, the writers and their associates are firmly convinced that such a plan is contrary to good practice. It is quite probable that there are unrecognized carriers of epidemic keratoconjunctivitis. Furthermore, some clinical cases may at times be diagnosed as simple conjunctivitis and find their way to the eye room in which the usual technics are being utilized, with resulting transmission of the disease to others. It is the opinion of this group that a careful communicable disease technic followed in a single eye room in industrial plants is far more productive of good control results than the setting up of a different procedure for the handling of cases and suspected cases of keratoconjunctivitis.

5. Patients with the disease were excluded from work for the period of time that acute signs of the disease persisted, such as congestion and lacrimation. When, in the judgment of the physician, the patients were sufficiently recovered and were no longer considered infectious, the employees were given permits to return to work. The fullest coöperation of industry was experienced in this particular control procedure. Employees of the various industrial plants in Detroit and the Detroit area, upon having their condition diagnosed as keratoconjunctivitis or suspicious of keratoconjunctivitis, were immediately given lay-off notices, which were not terminated until the employees had received "return to work" permits from the local Health Department.

6. After diagnosis, patients were advised of the communicability of their condition, the seriousness of the disease, and what procedures were to be followed in the control of the spread of the disease. Mimeographed information about sore eyes and precautions to be followed were given to every patient.

7. To give more complete information and assistance in the control of epidemic keratoconjunctivitis to industry, the Department of Health assigned communicable disease nurses the responsibility of visiting the industrial plants and assisting these organizations to establish good technic in their eye clinics. This service was offered to all industrial plants, both large and small, in Detroit; and in some instances to industrial plants outside the political boundaries of the city, but which employed residents of Detroit. When cases of epidemic keratoconjunctivitis were reported from a plant, these same nurses immediately solicited from the medical department an opportunity to assist in setting up proper technics in the eye clinic.

INCIDENCE

The first suspected case of epidemic keratoconjunctivitis was seen by the writers early in December, 1942. By retroactive investigations 16 cases of epidemic keratoconjunctivitis occurring between October 1 and December 19, 1942, were uncovered in a small industrial plant employing 120 persons. Of these cases 9 revealed corneal opacities and 1 of the 9 had extensive bilateral involvement with a 40 per cent reduction in visual acuity. It should be noted that the medical and first aid personnel of this organization were not aware of the fact that they were dealing with a communicable disease, and the control procedures referred to in this article were not established until the latter part of December; therefore only the last case reported from this organization developed after the inauguration of the precautionary measures in the eye clinic. No comparable attack rate was experienced in any other industrial plant in the Detroit area.

The diagnostic and treatment clinic at the Department of Health was established on December 19, 1942, and simultaneously the control procedures referred to above were in the process of promotion. During the following 6 months period 1,096 patients were seen in the clinic, of whom 247 were diagnosed as having keratoconjunctivitis. The largest concentrations of cases in industrial plants were 60 from a plant employing 90,000 persons, 29 from a plant employing 35,000 persons, and 20 from a plant employing 42,000 persons.

By comparing the experience subsequent to the establishment of the control procedures with the one outbreak prior to the efforts of the department, a difference is suggested in attack rates. Similarly, the attack rate of the disease in the Detroit experience was considerably lower than that reported by other writers. Although it cannot be said that the control procedures played a major part in the reduction of the incidence of the disease, it is probable that these practices did materially prevent the spread of keratoconjunctivitis in the Detroit experience. Certainly, meticulous care in the handling of all eye infections and eye injuries in industry as well as in the physician's office is necessary, and the educational value of these procedures to the medical personnel and patients is invaluable.

TREATMENT

Patients treated with the recommended standard methods of treatment showed very little evidence of benefit from these practices. Prescriptions of pontocain, adrenalin chloride, and a saturated solution of boric acid gave the greatest amount of symptomatic relief. Use of a 5 per cent solution of sulfathiazole sesquihydrate showed no evidence of benefiting the patients. After the disease had reached an advanced stage of development, cold boric compresses and the pontocain, adrenalin chloride mixture resulted in material symptomatic relief. The covering of the eye with an eye pad is contraindicated in the opinion of the writers, although dark glasses resulted in some comfort to the patients. A small absorbent pad fixed under the affected eye was a practice acclaimed by most patients as very comforting. This small absorbent pad prevented the flow of tears down the cheeks of the patients and eliminated the annoyance and discomfort of wiping the tears and also spared mechanical irritation of the affected eye. Although apparently a very simple procedure, on the basis of the reactions of the patients so treated, this practice is highly recommended.

In the search for therapeutic agents for the treatment of active infections, biological substances obtained from organisms have been studied. As an outcome of such research two of the most promising bactericides, penicillin and tyrothricin, have been isolated. The work of Dubos [5] on tyrothricin is suggestive of good results and the report of Rammelkamp [6] lends further support to the usefulness of this agent.

The use of a 30 mg. per cent solution of tyrothricin * in the treatment of cases of epidemic keratoconjunctivitis was suggested. The writers and their associates began to use tyrothricin on cases of epidemic keratoconjunctivitis late in the period of the epidemic and the clinical impression after the use of the product in a small series of cases was that the duration of the disease appeared to be somewhat shortened. Approximately one-half of the patients claimed that they experienced some symptomatic relief. The most significant impression, however, was the marked reduction in the incidence of complications. Table 1 presents a comparison between cases which were

* Supplied by Parke, Davis and Company

TABLE 1

Classification of 219 Patients According to the Duration of the Disease and Treatment

	Numbers		*Percentages*	
Duration	*Tryothricin*	*Symptomatic*	*Tryothricin*	*Symptomatic*
Less than 2 weeks	60	79	60	66
2 weeks or more	39	41	39	34
Total	99	120	100	100

TABLE 2

Classification of 219 Patients According to the Occurrence of Opacities and Treatment

	Numbers		*Percentages*	
Sequellae	*Tryothricin*	*Symptomatic*	*Tryothricin*	*Symptomatic*
Developed opacities	15	61	15	51
No opacities	84	59	84	49
Total	99	120	100	100

treated with tyrothricin and those which were treated by other methods. Two hundred and nineteen * cases are analyzed, of which 120 were treated by other methods and 99 were treated with tyrothricin. Table 1 does not reveal an appreciable difference in the duration of those cases treated with tyrothricin as compared to those treated by some other method.

In Table 2 the analysis of the same cases shows a marked difference in the incidence of opacities among those cases treated with tyrothricin as compared to those treated by other methods.

It seems apparent from Tables 1 and 2 that tyrothricin may be a valuable therapeutic agent for epidemic keratoconjunctivitis. However, the writers and their associates wish to acknowledge the fact that the experiment cannot be considered as well controlled.

In order to arrive at more reliable results, alternating cases of epidemic keratoconjunctivitis should be treated with tyrothricin and other therapeutic agents and certainly the series of cases should be larger than those herein presented. As noted heretofore, the use of tyrothricin was not started until late in the course of studies and the number of cases reporting to the eye clinic were becoming fewer. There are certain variables which may be present and may tend to favor the results of using tyrothricin. Illustrative of such variables is that the 99 cases treated with tyrothricin were the last 99 cases referred in the eye clinic.

The use of tyrothricin in the treatment of keratoconjunctivitis is herein presented to call attention to this new therapeutic agent and its probable value, and to suggest that well controlled experiments in the use of this product in the treatment of epidemic keratoconjunctivitis are indicated. Such experiments will be carried on in the event of another outbreak in the City of Detroit.

SUMMARY AND CONCLUSIONS

Epidemic keratoconjunctivitis has been made a reportable disease in the State of Michigan. Making the disease reportable is one of the first and most important steps to be taken in the control of this condition.

The inauguration of communicable disease technic in the eye clinics of industrial plants is a very necessary part of adequate control. This does not mean that separate eye rooms

* Twenty-eight cases, in which records are incomplete, have been deleted from this group.

should be set up for the diagnosis of keratoconjunctivitis. In fact, the establishment of separate quarters and procedures for cases and suspected cases of keratoconjunctivitis is contraindicated in the opinion of the writers.

The use of tyrothricin in this experiment suggests that it may be a valuable therapeutic agent in the treatment of keratoconjunctivitis.

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ACKNOWLEDGMENTS—The authors wish to express their appreciation for the clinical assistance rendered by Bert U. Estabrook, M.D., in the operation of the clinic and the assistance of E. C. Von der Heide, M.D., and E. A. Sharp, M.D., for the preparation of the tyrothricin solutions and blood studies of treated cases.

Relocation of Physicians

The Procurement and Assignment Service of the War Manpower Commission announces the relocation of 2,955 physicians to new localities of practice from January, 1942, to February 20, 1944.

Five hundred and ten areas of the country have been reported as being critically short of medical personnel. "The needs have been met" in 281 communities, or 55 per cent of the critical areas. Relocations were effected in 135 of these communities and the needs of 146 were met by inducing retired physicians to resume active practice, the "freezing" of medical personnel in civilian communities, and by other means.

The needs of 185 communities are reported as not yet met. In 166 areas no solution is apparent at present and only temporary or partial solutions have been effected in 16 areas. Mobile, Ala., Key West, Fla., Vallejo, Calif., and Velasco, Tex., are given as examples of communities in which medical facilities have been hard hit by the war and for which no solution has yet been found.

Current Progress in Sterilization of Air*

STUART MUDD, M.D., F.A.P.H.A.

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THE prevention and control of acute disease of the respiratory tract is the most serious problem and at the same time the most urgent challenge that today confronts medicine in general and industrial medicine in particular. Although diseases and injuries of occupational origin have long claimed the chief interest and attention of physicians in industry, it is now well established and generally recognized that in their frequency and importance non-occupational diseases far outweigh those conditions which arise from industry. The latter are chiefly responsible for stupendous losses in both time and money to employer and employee alike."

The sentences quoted opened an address by George Morris Piersol [1] at the Third Annual Congress on Industrial Health in January, 1941. Does examination of available data on industrial disability due to acute respiratory disease indicate that this challenge is being met in current practice? Quite the contrary. The frequency of sickness and non-industrial injuries causing disability for 8 consecutive calendar days or longer among a very large sample of industrial workers over the years 1933–1942 has been analyzed by the U. S. Public Health Service.[2] Sickness absenteeism among males due to respiratory disease has shown a steadily mounting rate since 1938; the rate for 1942 was higher than in any previous year of the 10 year period. For females the rate has been steady since 1939 but at a high level. Moreover, respiratory sickness in male industrial workers in the first quarter of 1943 [3] was far higher than in the corresponding quarter of 1942; indeed the respiratory rate for the first quarter of 1943 has never been equalled or exceeded during the 10 year period, the first quarter rate of 1943 exceeding the 10 year mean rate by 52 per cent.

Whatever are the causes of this high and mounting rate of industrial disability due to respiratory disease, common sense cautions us not to seek the complete explanation in the conditions of work in industrial establishments. alone. The packing of industrial and other workers in the ill-ventilated common carriers, trains, street cars, and busses, since rubber and gasoline shortages have been over-taxing already taxed transportation facilities, certainly provides one superlative opportunity for the spread of endemic and epidemic respiratory disease; crowded and confined places of amusement provide another.

In attempting to form even a rough estimate of the cost of this industrial disability, recourse may be had to smaller samples which have been sub-

* Presented before the Industrial Hygiene Section of the American Public Health Association at the Seventy-second Annual Meeting in New York, N. Y., October 13, 1943.

jected to more detailed analysis. Figures for a public utility for the period 1938–1941, inclusive, have been published [4]; these show that days lost from respiratory disease are more than a third of the total days lost from all causes of disability. Dr. Gafafer [5] has kindly permitted use of a similar table for 1942. This gives the average number of absences lasting one calender day or longer in a sample comprising about 2,500 male and 550 female employees in a public utility in 1942. The average number of days lost per person during 1942 due to respiratory disease was for males 3.1, for females 4.3. It is of course understood that the figures for one company cannot be taken as representative of conditions in American industries as a whole. These rates may be either too high or too low. To gain an idea of the approximate cost, if these rates were accurately representative, however, we may multiply these rates by the numbers of non-agricultural workers in the United States; these are approximately 26 million male and 14 million female workers.[5] This yields an approximate total (with the reservations mentioned) of over 80 million man-days and over 60 million woman-days (or over 140 million person-days) lost to industry in the United States through respiratory disease in 1942. On the basis of 300 working days per year, this waste is approximately equivalent to the time of 470,000 persons working for a year.

The bureau of Labor Statistics publishes monthly data on straight-time hourly earnings for manufacturing industries in the United States as a whole.[6] The author has computed an average daily earning by multiplying the straight-time hourly earnings (80.5 cents) by 8, the normal working day in American industry.* On this basis the loss in wages due to respiratory sickness amounts to roughly $900,000,000 per annum. This does not include the expenses for medical care, overhead expenses arising out of idle machinery and interruption in production schedules, etc.

RELATIONSHIP BETWEEN RESPIRATORY DISEASE AND THE INFECTIOUSNESS OF AIR

Persons sneezing, coughing, or even speaking loudly expel into the air large numbers of minute droplets which may contain in a viable and infective state any pathogenic bacteria or viruses present in their oral secretions. The larger of these potentially infectious droplets have a flight range of about a meter; they are conspicuous, are easily recoverable on bacteriological plates, and their ability to transmit respiratory infection is obvious. When droplets or sputa have dried on solid surfaces their residues may become the source of infective dust.

The rôle of droplets was notably stressed by the German hygienist Flügge † in 1897,[7] and the doctrines of "droplet-infection" and dust-infection, or transmission of respiratory infection by droplets and by infective dust dominated thinking in regard to respiratory disease for thirty years.

The greater part of the potentially infective material expelled by persons into the air, however, is not contained in droplets visible without special means, but in smaller droplets which evaporate almost instantaneously. The basic experimental demonstration was made by Wells [8] in 1933–1934 that much of the enormous germ-load con-

* It is unfortunate that daily rates of pay are not available. Since the figure representing costs of time lost due to respiratory disease is at best only an approximate one the straight hourly earnings (excluding overtime earnings) are multiplied by 8 to secure a daily wage. It is recognized that this is somewhat arbitrary.

† Actually, however, Flügge himself appreciated the importance of invisible droplets accompanying the coarser visible droplets; these he recognized may persist in air for hours and reach distant parts of enclosed spaces.

veyed to the atmosphere by the evaporated residues ("droplet-nuclei") of these finer droplets, remains viable for hours or even days in the air of enclosed spaces and is wafted about like smoke to convey pathogenic bacteria or viruses to those who share the confined air. The atomizing of mouth and nose secretions into the air has lately been revealed with dramatic vividness by high-speed photography.[9] The enormously important rôle of pathogens floating in confined air in the dissemination of respiratory disease has now been adequately documented by animal experiments, by observations in controlled human environments, and by epidemiological deductions; the evidence to 1941 has been conveniently assembled in the volume *Aerobiology*, published by the American Association for the Advancement of Science with the aid of the Committee on Aerobiology of the National Research Council.

Any attempt to appraise current progress in the sterilization of air must, however, take account of the historical background. Members of the medical profession who now occupy responsible positions in practice, in teaching and in administration have been thoroughly trained in the doctrine of "droplet-infection." Recognition of the greater importance of true air-borne infection has only come within the past ten years, and has deeply impressed only the relatively small number of those who have seriously examined evidence which is either very modern, or very old (of course important foundations of the germ theory of disease were laid by the studies of Pasteur, Tyndall, and others on microörganisms in the air). Lack of a more insistent demand on the part of the medical profession for practical solution of the problems of air-borne infection might seem incomprehensible if this background were lost sight of. Lacking adequate demand by many prominent members of the medical profession for progress in securing pure air supplies, air conditioning, from the standpoint of health at least, has somewhat neglected the main point. The point is that, just as intestinal disease has in considerable measure been controlled by reducing the germ-load of water and milk, for the control of air-borne respiratory disease practical measures for reducing the germ-load of confined air must be instituted.

CONTINUOUS DISINFECTION OF AIR

Effective continuous disinfection of the air of enclosed spaces has already been shown to be practicable where conditions are favorable and where the problem is approached with adequate determination and technical facilities and skill. The practical means are physical (ultra-violet radiation, dust suppressive measures) and chemical (germicidal vapors). Doubtless physical and chemical means will each find appropriate place as mutually complementary measures in the fully matured art of providing non-infectious air in our future homes, transport vehicles, and places of work and recreation.

Ultra-violet Radiation—Application of ultra-violet radiation to disinfection of air has been systematically reviewed in the A.A.A.S. volume on *Aerobiology*. The physiological and the germicidal effects of ultra-violet radiation, and the characteristics and standardization of commercially available ultra-violet sources are presented in detail. Successful application of ultra-violet radiation to reduction of wound infections in the operating room are presented by Dr. Deryl Hart, the pioneer in this field, and by Drs. Kraissl and Wilson of Columbia. Cross-infections in hospital wards and in children's nurseries and schools are reviewed and analyzed, and success in reduction of these cross-infections by appropriate use of ultra-violet irradiation is recorded. More

detailed analyses of successful control of childhood contagions in schools have been published by Wells, Wells, and Wilder,[10] and by Wells and Wells.[11]

More recent records of germicidal action against bacteria and viruses by ultra-violet radiation in a children's hospital, with reduction in cross-infection, have been published by Robertson, Doyle, and Tisdale,[12] by Sommer and Stokes,[13] and Henle, Sommer, and Stokes.[14] The Council on Physical Therapy of the American Medical Association has found ultra-violet lamps acceptable as an adjuvant in the disinfection of air,[15] and commercially available burners and fixtures of several types have been approved by the Council[16] for use in the operating room, hospital nursery, and hospital ward.

The statement of the Council on Physical Therapy on acceptance of ultra-violet lamps for disinfecting purposes contains carefully considered appraisal of the present status of the practical art. Pertinent statements are quoted below:

"At the present juncture the design and installation of ultra-violet lamps in their fixtures for disinfecting purposes is empirical and the adequacy of disinfection by any given installation of lamps must be judged by clinical experience. For example, clinical evidence has been submitted to the Council showing that, in a scarlet fever ward (size about 60 by 27 by 11 feet) containing sixteen cubicles, four lamp units, each one emitting a radiant flux of 30 microwatts per square centimeter at 1 meter, were found inadequate; but eight lamp units in the ward, each unit protecting two cubicles, and a ninth unit at the entrance, prevented cross-infection. This is a rather high intensity (requiring twenty minutes calculated time to produce a minimum perceptible erythema) incident on a person of average height, standing directly under a lamp fixture suspended from a ceiling of average height. A greater number of lamps, each one of lower ultra-violet intensity (say 20 microwatts per square centimeter at 1 meter) and lower power input, more evenly distributed throughout the room should be safer and equally efficient in disinfecting the air. This is a matter of engineering design, beyond the scope of the Council's purview.

. . .

"Since the ultra-violet emission from the low vapor pressure mercury discharge tube is practically homogeneous radiation of wave-length 2,537Å, such a lamp can be readily calibrated in absolute value and used as a standard. The intensity at 1 meter may be only one-fifth of the Council's unit, or 20 microwatts per square centimeter, for safety to the occupants. This will require a minimum exposure of two hundred and fifty to five hundred seconds for adequate disinfection, which will depend on the rate of circulation and average distance of the air in front of the lamp. Evidence has been submitted to the Council showing that cross-infection in a contagious ward may be prevented by using a sufficient number of lamp units, each unit having an intensity of 30 microwatts per square centimeter at a distance of 1 meter from the burner. This will require an exposure of one hundred and sixty-seven to three hundred and thirty-four seconds for adequate disinfection, which implies a slow movement of the air in front of the lamp installation.

. . .

"The use of ultra-violet radiation for disinfecting air in industrial plants, barracks, school rooms, assembly halls, refrigerators and so on also appears to be outside the Council's purview. In fact, at this juncture the whole question of the use of ultra-violet radiation for disinfecting purposes is too complex and too little understood for the Council to do more than attempt to keep the medical profession informed regarding particular ultra-violet lamps that are acceptable for use in this method of disinfecting air in hospitals, nurseries and operating rooms (relatively free from dust) as practiced by present day empirical methods."

It must be emphasized that the Council's acceptance statement does not prejudge the applicability and the usefulness of ultra-violet radiation to the problem of disinfecting the air of industrial plants, offices, assembly halls, railroad cars, etc. It emphasizes, however, that the specifications of engineering design and other features determining the adequacy and safety of the practical art must be further developed and applied before evaluation will become possible.

Another paragraph of the Council's statement discusses responsibility for design of installations.

"It is to be noted that a lamp used for disinfecting purposes is a single unit in an installation, and that compliance of the ultra-violet output of a single lamp unit with the Council's requirements does not insure adequate radiant disinfection or the safety of the occupants of the room in which an installation of such lamps is in actual use. Obviously the manufacturer and distributor of such lamps must assume some responsibility for the adequacy of the lamp installation for purposes of radiant disinfection of the air and for the adequacy of the protection from injury of the occupants of the space irradiated. Concerning these questions the Council cannot undertake supervision or assume responsibility for the satisfactory performance of any particular installation."

The Senior Biophysicist of the Division of Industrial Hygiene, National Institute of Health (who also is Associate Referee for the A.P.H.A. on Disinfection of Air by Ultra-Violet Irradiation), has critically reviewed applications, precautions, and limitations of the use of ultra-violet irradiation to disinfection of air.[17] The statement of the Council on Physical Therapy is quoted with approval[17]: "Obviously the manufacturer and distributor of such lamps must assume some responsibility for the adequacy of the lamp installation for purposes of radiant disinfection of the air, and for the adequacy of the protection from injury of the occupants of the space irradiated."

Acceptance by the engineering groups in whose province air hygiene may be considered as properly falling, of a measure of responsibility for elaborating specifications for proper design and servicing of installations would be an important step toward development of a practical art of air hygiene.

The efficacy of ultra-violet irradiation in killing air-borne bacteria and viruses under conditions in which the air is relatively free from dust and lint has been confirmed in Great Britain by Andrewes and others[18] and by Edward, Lush, and Bourdillon.[19] The difficulty of disinfecting dust-laden air by this means has also been emphasized. Andrewes, *et al.* suggest the combination of air filtration and ultra-violet irradiation in recirculation systems and for certain special purposes.

Germicidal Vapors—The spraying of germicides into the air was of course a part of the technic of antiseptic surgery. Modern interest in germicidal mists was stimulated by the demonstration by Douglas, Hill, and Smith,[20] Trillat,[21] Masterman[22] that certain bactericidal substances, e.g., NaOCl and a number of phenolic compounds, when dispersed in the air as fine mists or aerosols exerted a highly lethal effect on air-borne bacteria. Twort, Baker, Finn, and Powell[23] found that hexyl-resorcinol dissolved in propylene glycol made a highly effective and satisfactory germicidal aerosol.

An inclusive and practical discussion of the problems of air-borne infection and means for its amelioration in wartime Britain has been presented by Andrewes and others.[18] Concerning germicidal mists and vapors they conclude:

"*Hexyl-resorcinol* in propylene glycol has proved perhaps the most effective under laboratory conditions, but unfortunately neither the antiseptic nor its solvent is at present readily enough available * in large amounts to warrant its introduction except for special purposes."

Considerations of economy and practicability as well as of efficacy have served to focus attention in Britain on the germicidal value of hypochlorites and hypochlorous acid. Actually the use of hypochlorites for purification of air was first tried in England as early as the influenza pandemic in 1918. Masterman[24] reviews in detail the early history and various controversial aspects of the use of hypochlorites for air purification. He describes an atomizing de-

* Hexyl-resorcinol is at present available in limited amounts and the glycols are available in large amounts in the United States.

vice (Dynalysor) as already in successful operation. "For many months the Dynalysor has been successfully employed for hypochlorite spraying in hospitals, offices, and other inhabited rooms, and air purification by hypochlorites is not a scheme 'with definite possibilities' but a successful *fait accompli*." Masterman concludes that HOCl gas is the active germicide in hypochlorite spraying.

Bourdillon, Lidwell, and Lovelock [25] have reported success with hypochlorite atomized by a hand spray in disinfecting air contaminated by sneezing. They note certain unfavorable conditions, "such as low relative humidity or high content of organic matter in the air, which may hinder the action of hypochlorite sprays."

Edward and Lidwell [26] report favorable tests on sterilization of air-borne influenza virus with hypochlorous acid gas.

"A concentration of 1 vol. of gas in 2 million vol. of air is probably effective in destroying 99 per cent or more of virus particles when the proportion of these in the air is small. Preliminary experiments on mice and cats are recorded which failed to reveal any toxic effects produced by inhaling the gas in relatively high concentrations or for prolonged periods. Acute irritation of mucous membranes only was found. This did not appear to lead to any increased susceptibility of mice to subsequent infection with influenza."

Exploration of the possibilities of continuous disinfection of air by chemical substances has made and is making rapid progress in America through the work of O. H. Robertson and his associates. They determined that certain of the glycols alone, notably propylene glycol [27] and triethylene glycol,[28] provided promising means for continuous disinfection of air. They demonstrated that the germicidal action depended, not, as earlier supposed, upon collision of fluid droplets with air-borne bacteria, but upon condensation of hygroscopic glycol molecules upon air-borne droplets containing bacteria. One gram of propylene glycol dispersed as vapor in 5 or 10 million ml. of air and 1 gram of triethylene glycol vapor in several hundred million ml. of air was found to kill pathogenic respiratory bacteria and the virus of influenza in air in seconds or minutes. Rat and monkey colonies kept constantly in atmospheres saturated with vapors of propylene glycol for periods up to 18 months, and triethylene glycol up to a year suffered no ill effects detectable by observation or microscopic examination.[29]

"The germicidal activity of glycol vapors is markedly influenced by certain environmental factors, the most important of which is atmospheric humidity.[29] A dry atmosphere is unfavorable. Likewise desiccated bacterial particles are not as susceptible to the vapor action as are moist ones. It has been found that the glycols are most effective at relative humidities between 40 and 60 per cent."

Subsequent work by Bigg, Jennings, and Fried [30, 38] places the relative humidity for maximal germicidal action of glycol vapors at from 30 to 50 per cent. These papers [30, 38] indicate also the types of apparatus that are being developed for disinfection of the air of large enclosed places by glycol vapors.

Careful investigation of the possibility of fire hazard resulting from the dispersal of glycol vapors into the atmosphere of enclosed spaces has also been made by Bigg, Jennings, and Fried.[31] These authors conclude:

"In the vapor-phase concentration required for air sterilization, propylene and triethylene glycol offer absolutely no fire or explosive hazard. The addition of water to these substances greatly reduces the possible fire hazard produced by their presence in storage or vaporizing devices."

Clinical application of glycol vapors during the winters of 1941–1942 and 1942–1943 are recorded by Harris and Stokes [32, 33] working at the Children's Seashore House in Atlantic City. This

convalescent home has a relatively stable population and the children in the wards are confined to their beds and thus subject to a minimum of contact or direct-droplet infection. Experimental and control wards were carefully matched; indeed in the second study [33] control and glycol-vapor wards were alternated for 3 week periods throughout the respiratory season. Ill effects were not encountered. The germ-load of the air was shown to be greatly reduced by the glycol vapors as judged by direct plate counts. In the preliminary study 2 respiratory infections occurred in the vapor-containing ward as compared with 16 in the analogous control ward. In the second and larger study 5 respiratory infections occurred in the vapor-containing wards as compared with 100 in the similar control wards without glycol vapor.

In his report as Associate Referee on Disinfection of Air by Germicidal Vapors and Mists,[34] Professor O. H. Robertson writes:

> "Practical application of the use of glycol vapors for the purpose of controlling air-borne infection has had to await the construction of suitable apparatus for the dispersion of glycol vapors into large enclosed spaces and the development of an instrument to control automatically the concentration of glycol vapor in the air. Rapid progress is being made in the solution of both these problems."

Discussion of dust in industry would be outside the scope of this review. Consideration of the air as a vehicle of infection would be very incomplete, however, without reference to the importance of dust, both as a carrier of pathogenic bacteria and viruses and as a shield of air-borne pathogens against the means used for disinfection of air, such as ultra-violet radiation and germicidal vapors. British investigators [35] in particular, working under wartime conditions, have found dust a very serious obstacle to application of measures for disinfection of air. They have introduced practical methods for reducing dust from floors, textiles, and bed clothes by treatment with light paraffin oils.[18, 35]

Experiments on the reduction of the infectivity of dust by floor irradiation with ultra-violet have been instituted by Hollaender, du Buy, Ingraham, and Wheeler.[36] As a result of these experiments they suggest that "floor irradiation be combined with ceiling irradiation in practical tests in barracks or hospital wards to determine the effect of any ultra-violet irradiation in lowering morbidity rates or preventing cross-infection." They caution that "if such experiments be attempted it must be borne in mind that certain types of flooring may prove to be capable of reflecting sufficient amounts of ultra-violet to cause harmful effects."

As this review goes to press (April, 1944) the author is informed by Dr. Edward Bigg [37, 38] that practical apparatus has been constructed and utilized for introduction into the air of properly humidified glycol vapors. Boiling glycol-water solutions are maintained automatically at any desired relative concentration. "The vapors emitted from such boiling solutions are of constant composition and are bactericidal. . . . A predetermined rate of delivery and concentration of water and glycol vapor may be accurately produced by varying the heat input and the temperature of the boiling mixture." [37]

SUMMARY

Respiratory disease is responsible for more than a third of the total number of person-days lost to American industry by disability. The air of enclosed spaces is at present the principal vehicle for the dissemination of respiratory disease. The rationale of rendering air safe for human occupancy has been laid down in the laboratory and in suitable controlled human environments.

The means are ultra-violet irradiation, dust-suppressive measures, and the use of germicidal vapors of hypochlorous acid and of propylene and triethylene glycol. Elaboration of the practical art of providing safe air supplies is, however, not to be accomplished cheaply or through the efforts of a few people. A specialty or specialities in sanitary engineering will have to develop around air sanitation, as has occurred around water and milk sanitation. Physicians, air conditioning specialists, heating, ventilating, and illuminating engineers, the manufacturers of necessary equipment, agencies regulating public health practice; and the industries which will benefit by reduction of industrial disability through respiratory disease ultimately will all have to contribute effort and money to solving the manifold aspects of the problem. How much is it worth to reduce an annual industrial waste equivalent to the output for a year of approximately 470,000 persons?

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Baruch Grant for Physical Medicine

Bernard M. Baruch, Washington, announced in April a gift of $1,100,000 for teaching and research in physical medicine. The inauguration of the program was through the Baruch Committee on Physical Medicine, of which Ray Lyman Wilbur, M.D., Chancellor of Stanford University, is Chairman.

The committee has announced a grant to Columbia University College of Physicians and Surgeons, New York, of $400,000 for the establishment of a key center of research and teaching of physical medicine, with special reference to its application to returning veterans. The sum is to be expended over a 10 year period to give immediate assistance in maintaining an adequate supply of medical specialists to handle the problems of war and post-war physical rehabilitation. Similar grants of $250,000 each were made to New York University College of Medicine, and the Medical College of Virginia, Richmond, from which the late Dr. Simon Baruch, father of Mr. Baruch, graduated in 1862.

Selected medical schools are to receive another $100,000 to develop an immediate program for the physical rehabilitation of war casualties and those injured in industry and $100,000 is set aside for the establishment of Fellowships or Residencies in this field.

The offices of the committee have been established under the direction of Frank H. Krusen, M.D., at 597 Madison Avenue, New York, N. Y.

Nutritive Value of Canned and Dehydrated Meat and Meat Products*

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DURING the last few years a considerable fund of information regarding the nutritive quality of meat has accumulated in the scientific literature. Most of these data refer to raw products. Since the effect of cooking or processing upon the various nutrients has been relatively little known until recently, calculations of the dietary contributions of meat have been difficult. Within the last two years, many studies of the effects of temperatures similar to those used in household cooking have been completed and we are now able to assess more accurately the contribution by meat to the diet.

However, the nutritive value of commercially processed meats has not been studied adequately. With these products another complicating factor, that of storage, may be as important as the processing operation itself with respect to the retention of certain of the vitamins. The work reported here has been carried out in an effort to provide information concerning changes which may occur during either processing or storage. Attention has been directed mainly toward canned and dehydrated meats. Other studies dealing particularly with the changes in the quality of the protein during the preparation of these types of products have already been reported by Poling, Schultz, and Robinson.[1]

Using rats as experimental subjects, these investigators found no appreciable differences between the growth promoting properties of canned or dehydrated meats and the corresponding raw products when the various samples were used as sole sources of protein at adequate levels in the diets. Two series of experiments were conducted. One was designed to detect even slight variations in quality; and the other to determine whether differences which might be detectable were of practical significance. For the first series the proteins were supplied at a 9 per cent level, thus making protein the factor limiting growth. Under such conditions the animals were especially sensitive to differences in protein quality. In the more practical experiment, proteins were supplied at an 18 per cent level. Table 1 summarizes the data as previously reported.

Referring to Table 1, it is evident that there is a slight difference in the food efficiency in favor of the raw meat as compared to canned. While the difference only borders on statistical significance, it indicates that there may be a reduction in protein quality in the canned products. From Experiment 2, it appears that dehydrated beef is equal in protein quality to canned cured pork, but slightly inferior to dehydrated pork. That heating reduces the nutritive value of proteins

* Presented before the Food and Nutrition Section of the American Public Health Association at the Seventy-second Annual Meeting in New York, N. Y., October 12, 1943.

TABLE 1 *

	Protein Source	Average Gain gm.	Average Protein Intake gm.	Gm. Gain per Gram Protein
Protein Efficiencies—9 Per cent Levels				
Exp. 1 †	Raw Cured Pork	135	62	2.18
	Canned Cured Pork	124	62	2.00
Exp 2 ‡	Canned Cured Pork	126	55	2.29
	Dehydrated Pork	155	56	2.77
	Dehydrated Beef	114	50	2.28
	Roast Fresh Pork	149	65	2.29
	Fried Fresh Pork	175	68	2.57
Protein Efficiencies—18 Per cent Levels				
Exp. 3 **	Raw Cured Pork	191	100	1.91
	Canned Cured Pork	194	99	1.96
Exp. 4 ‡	Canned Cured Pork	256	144	1.78
	Dehydrated Pork	259	139	1.86
	Roast Fresh Pork	262	139	1.88
	Fried Fresh Pork	282	146	1.93
	Dehydrated Beef	262	149	1.76

* Condensed from Poling, Schultz, and Robinson [1]
† 10 weeks' duration (paired feeding)
‡ 10 weeks' duration (ad libitum feeding)
** 8 weeks' duration (paired feeding)

has been inferred by other investigators [2] who implied that the reduction in quality was great enough to be significant for human consideration. The data in Table 1 refutes this assumption, since animals receiving 18 per cent protein diets showed the same gain per gram of food regardless of whether the protein was supplied as raw, cooked, canned, or dehydrated meat. As this level of protein corresponds to that customary in human diets, it is evident that the nutritive qualities of the proteins have not been impaired for dietary considerations.

As reported hereafter, the effects of processing on the vitamin content of meats indicates that there is little if any greater loss of vitamins during canning or dehydration than during home cooking of similar cuts of meat. The losses also appear to be similar to those involved in cooking or canning of most cereals or vegetables. This evidence has been obtained by assaying representative portions of meat at various stages during the processing operations.

EXPERIMENTAL

Analytical Methods—All samples were prepared for analysis by homogenizing with a known quantity of water in a Waring Blendor. Aliquots of the suspensions were then weighed into volumetric flasks and assayed for thiamin by the Conner and Straub [3] modification of the thiochrome procedure, and for riboflavin, niacin, and pantothenic acid by methods similar to those of Cheldelin, Eppright, Snell, and Guirard.[4]

Vitamin Retentions During Dehydration—The preparation of dehydrated meats and methods of sampling have been previously described.[5] For stability studies 1 lb. cans filled with a well mixed commercially dehydrated pork were closed under vacuum in the regular canning line and stored at various temperatures.

That dehydrated pork or beef retains most of the vitamin content of the original meat is shown in Table 2. For comparison the percentage retentions of the various vitamins during cooking

TABLE 2

Vitamin Retentions During Dehydration of Meat *

	Thiamin		Riboflavin		Niacin		Pantothenic Acid	
	Mg./Gm.	Per cent Ret.	Mg./Gm.	Per cent Ret.	Mg./Gm.	Per cent Ret.	Mg./Gm.	Per cent Ret.
Raw Pork	6.6	..	2.3	..	43.7	..	4.5	..
Cooked Pork	7.4	71	3.1	107	57.0	88	...	..
Dehydrated Pork	13.8	63	7.5	104	124.1	92	10.2	73
Roasted Pork †	...	68	...	85	...	94	...	..
Raw Beef	0.6	..	2.0	..	49.5	..	3.4	..
Cooked Beef	0.9	91	3.5	109	77.4	96	4.0	72
Dehydrated Beef	1.4	76	6.2	105	134.0	92	6.8	68

* Condensed from paper by Rice and Robinson.[5]
† Reported by McIntire, Schweigert, Henderson, and Elvehjem.[6]

of pork by methods used for meat of similar quality is included in this table. This subject has been discussed elsewhere in greater detail.[5] The excellent retention of the vitamins in these products is due in part to the utilization of cooking juices.

Vitamin Retentions During Canning —Raw pork trimmings, ground and well mixed, were sampled before the addition of curing mixture amounting to approximately 5 per cent by weight. After curing, the meat was divided into two portions, one portion being packed into 12 oz. cans and the other into 6 lb. cans. Samples were taken and the remainders of the two lots of cans were processed according to the regular commercial schedules. Six lb. cans were held at 235° F. for 3⅓ hours in order to assure a center temperature of 225° F. The 12 oz. cans required a few minutes more than an hour at 232° F. The entire contents of representative cans were ground and mixed prior to sampling, thus assuring even distribution of the small amounts of broth. Twelve oz. cans of the finished products were stored for stability studies. The analytical data obtained on the raw, raw cured, and canned samples are presented in Table 3. In the 6 lb. cans, 43 per cent of the thiamin was retained as compared to 67 per cent for the 12 oz. pack. Except for thiamin there appears to be no difference in the vitamin retention in content of the two sizes of containers. Unfortunately, inhibiting substances in the raw meat or stimulating substances in the cooked products interfered with the microbiological assays at the time the experiment was

TABLE 3

Vitamin Retention in Cured Pork During Canning

Type of Product	Vitamin Content in Mg. per Gram			
	Thiamin	Niacin	Riboflavin	Pantothenic Acid
Cured Luncheon Meat				
Raw	7.5	37.0	2.3	4.1
Raw (Plus Cure)	7.1	34.0	2.2	4.1
Canned (12 oz.)	4.8	34.4	2.3	3.4
Canned (6 lb.)	3.1	35.0	2.4	3.4
Retention (12 oz.)	67%			
Retention (6 lb.)	43%			
Cured Chopped Ham				
Raw (Plus Cure)	7.9	37.6	1.7	3.3
Canned (12 oz.)	5.4	35.4	1.5	2.5
Retention	68%	94%	90%	76%

conducted, so that the recoveries of niacin, riboflavin, and pantothenic acid were exaggerated. However, the similar values obtained for different sizes of cans indicate that except for thiamin the more severe processing schedule necessary for the larger cans did not affect the vitamin potencies. After improvement of the microbiological methods, a number of experiments with 12 oz. cans were performed to eliminate the effect of interfering substances. Results from one such experiment have been listed in Table 3. Cessation of the production of 6 lb. packs has prevented repetition of the earlier work.

These data are in close agreement with those of Reedman and Buckley,[7] who very recently reported thiamin retention in 6 lb. packs of Canadian pork luncheon meat to be 47 per cent of the amount in the raw meat. The findings are markedly different from those of Stanley[8] who claims the thiamin retention of commercially canned or home canned pork to be only 20 per cent. Unfortunately, her data are not presented, so the experimental conditions cannot be compared with those now in use. This great loss appears to be entirely out of line with the thiamin retentions found for other cooking and canning operations and must represent samples that have been prepared by long heating at high temperatures. Although commercial processing methods differ greatly from those used in household cookery, the retention of the vitamins by both methods is practically the same if the vitamin content of the cooking juices is included with that of the cooked meats.

Vitamin Retentions During Storage—In order to determine the effect of storage upon the vitamin content of these products, replicate samples of canned cured pork (12 oz. sample) and of dehydrated beef and dehydrated pork were stored at constant temperatures of –20°, 38°, 80°, 99°, 120°, and 145° F. (–29°, 3°, 27°, 37,° 49°, 63° C.). All samples were vacuum packed, this being the usual commercial procedure. At intervals samples were removed for assay. In canned pork, there was excellent retention of the vitamins at temperatures to which this type of product would ordinarily be exposed (Table 4). Even thiamin, the most thermolabile of the B-factors determined, is retained to the extent of 52 per cent for a period of about 10 months at 80° F. At 38° there is only 7 per cent loss of this vitamin. At higher temperatures the loss is

TABLE 4

Retention of Vitamins in Canned Pork During Storage *

Vitamin	*Storage Period Days*	*Storage Temperature in °F.*					
		–20°	*38°*	*80°*	*99°*	*120°*	*145°*
Thiamin	28	4.9	4.7	4.6	4.1	2.9	0.8
	81	5.2	4.9	4.1	3.2	0.9	0.1
	235	4.9	4.6	3.7	1.0	...	...
	293	5.2	4.8	2.7	1.4	...	...
Niacin	293	34.5	35.5	35.3	35.5	34.0	33.0
Riboflavin	293	1.8	1.9	1.9	1.9	1.5	1.2
Pantothenic Acid	293	3.6	3.7	3.8	3.4	2.2	2.3
Retention of Vitamins in Dehydrated Pork During Storage *							
Thiamin	58	14.3	14.1	7.4	1.9	0	0
	130	15.4	14.1	3.8	0.6	...	...
	219	15.9	...	2.0	0.6	...	...
Niacin	219	107.7	...	109.5	107.7	107.6	109.9
Riboflavin	219	6.9	...	6.9	7.0	6.0	5.8
Pantothenic Acid	219	11.9	...	12.0	8.4	5.0	4.6

* Potencies of the samples are listed in micrograms per gram

naturally much more rapid. This fact should be kept in mind during the handling of canned meats. The beneficial effects of cool storage temperatures hold here as with other foods.

Even at 99° F., there is very little if any loss of niacin, riboflavin, or pantothenic acid. Under more severe storage conditions, 120–145° F. the latter two are destroyed to some extent. Since such high temperatures are rarely encountered by products for domestic consumption, the niacin, riboflavin, and pantothenic acid contents of canned meats may be expected to remain constant for long periods of time.

Dehydrated pork, like the canned product, retained niacin, riboflavin, and pantothenic acid well at temperatures up to 99° F. (Table 4). Above this there were losses of riboflavin and pantothenic acid. Even 145° F. storage did not reduce the amount of niacin in the samples. Thiamin appears to be less stable than in the canned pork, decreasing in quantity rather rapidly, even at 80° F.

Although storage of dehydrated beef has been studied much less extensively, the results indicated vitamin losses no greater than those for pork. Retentions of niacin, riboflavin, and pantothenic acid were 100 per cent after 219 days storage at 99° F. The initial low thiamin potency of dehydrated beef made it difficult to obtain accurate results with this vitamin, but those obtained indicate that the retention of thiamin was no better than that of dehydrated pork.

DISCUSSION

Dehydration or canning of meat does not greatly reduce its nutritive quality, the greatest of the changes which do take place occur in the thiamin and pantothenic acid potencies. Likewise, storage of processed meats at moderate temperatures does not affect their food value except for loss of thiamin. Under ordinary storage conditions the other vitamins appear to be stable for indefinite periods. At temperatures of 120° F. and above, there is a gradual slow decrease in the riboflavin and pantothenic acid contents. When such temperatures are encountered during the transportation and storage of foods, as in tropical regions, these losses and those of thiamin must be considered by those concerned with dietary problems.

Since dehydrated or canned meats are already cooked, they may be consumed as purchased, merely warmed, or mildly cooked in combination with other foodstuffs. Losses in preparation for consumption, therefore, are slight. Meat loaf composed largely of reconstituted dehydrated pork retains 80 per cent of the thiamin of the raw meat loaf mixture. Decreases in the quantities of the other vitamins are negligible, the values for the raw and cooked loaves checking within the limits of accuracy of the methods.

In so far as can be determined from the limited data available, the effects of processing upon other foods are similar to those upon meat. Baking of bread involves losses of 20–21 per cent of the thiamin [9] but does not decrease the amounts of riboflavin.[10–11] Vegetables lose from 10 to 40 per cent of their thiamin during dehydration or canning [12] and an average of 35 per cent in cooking.[13] Russell, Taylor, and Beuk [14] show that in cooking various types of vegetables, niacin is retained to the extent of 80 to 90 per cent if the cooking liquors are included with the solid portions. Storage of dehydrated vegetables apparently does not greatly decrease the thiamin content,[12] but Farrell and Feller [15] report storage of canned green beans for a year at 38° F. to result in a 28 per cent loss of this vitamin. Destruction of thiamin due to processing of evaporated milk ranges from 23 to 35 per cent. Storage increases this loss by

another 50 per cent in one year.[16]

Cereals and legumes ordinarily show little loss of any of the vitamins except during baking or long cooking unless the cooking water is discarded. Except for these, the vitamin losses for meats are typical of all classes of foodstuffs.

SUMMARY

1. Protein quality is not significantly reduced during dehydration or canning unless diets very low in proteins are considered.

2. Vitamin retention of pork and beef undergoing dehydration or canning is similar to that for household cooking of similar meats, being: Thiamin, 60–70 per cent; riboflavin, 90–100 per cent; niacin, 90–100 per cent; and pantothenic acid, 70–80 per cent.

3. Cured pork undergoing commercial canning (12 oz. can) retains 67 per cent of its thiamin, 90 per cent of its riboflavin, 94 per cent of its niacin, and 76 per cent of its pantothenic acid. Thiamin retention in 6 lb. cans is lower, being 40–50 per cent.

4. During storage of either canned pork, dehydrated pork, or dehydrated beef at temperatures up to 99° F. there is little or no loss of niacin, riboflavin, or pantothenic acid over a period of 219 days. Above 120° F. there are slow losses of riboflavin, and pantothenic acid. Thiamin decreases more rapidly, showing some loss at 80° F. After 293 days' storage the thiamin retention in canned pork is 52 per cent. In dehydrated pork the retention is poorer, being 29 per cent after 219 days at 80° F. At higher temperatures there is almost complete destruction of thiamin in both products.

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Nutritive Values of Canned Fruits and Vegetables*

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ANY consideration of the effect of food preservation methods on foods might well be prefaced by a description of the characteristics of freshly harvested foodstuffs. An examination of tabulations of proximate compositions of foods [1] suggests that in general fruits and vegetables are not particularly important dietary sources of carbohydrates, proteins, or fats. Exceptions to this generalization may be found in the case of carbohydrates in fruits packaged in heavy syrup, proteins from the legume type vegetables, or even the oils in ripe olives. Aside from their esthetic properties, the high position accorded fruits and vegetables is thus based largely on their contributions of other nutrients.

The wide variety of fruits and succulent vegetables used for food precludes, however, any detailed review of the dietary properties of individual products. In view of the variations in contents of nutrients from sample to sample a detailed consideration of the mineral and vitamin values of specific foods would be of questionable importance. By way of illustration, ascorbic acid values ranging from 9.8 to 55.8 mg. per 100 gm. for tomatoes and 14.0 to 82.5 mg. per 100 gm. for oranges have been reported.[2] Vitamin A values ranging from 1,700 to 36,000 International Units per 100 gm. of carrots and thiamin values of 100 to 840 μg. per 100 gm. of peas are also reported. Variations of these orders in mineral contents from sample to sample of specific vegetables have also been observed.[3] Hence, the more useful practice of grouping fruits and vegetables according to similarities in nutritive values might be considered, such as:

1. Tomatoes and citrus fruits
2. Leafy green and yellow vegetables
3. Other fruits and vegetables

This classification provides a practical and convenient basis for discussion of dietary values of the canned as well as the fresh varieties.

The recommendation [4] that in practical dietary management two or more servings of products included under "other fruits and vegetables" be eaten every day, is predicated on the general vitamin and mineral values of such foodstuffs, especially in the amounts customarily consumed. The specific recommendation of at least one serving of, "tomatoes and citrus fruits" per day is based on the relatively high ascorbic acid contents of these materials. The exceptional values of, "leafy green and yellow vegetables" as sources of provitamins A make the inclusion of at least one serving of them per day also highly desirable.

Since variations from sample to sample in the composition of raw stock

* Presented before the Food and Nutrition Section of the American Public Health Association at the Seventy-second Annual Meeting in New York, N. Y., October 12, 1943.

are reflected directly in the canned products, the nutritive values of canned fruits and vegetables may best be discussed in terms of properties of the vitamins and minerals, and the possible effects of cannery operations on these constituents in foods.

SOLUBILITIES AND STABILITIES OF NUTRIENTS

The known stabilities of sugars, starches, fats, proteins, crude fiber, and organic acids in fruits and vegetables to moist heat indicate that the chief changes with respect to these nutrients likely to accompany canning are associated with manipulations prior to sealing the product in the can. Although there is some uncertainty regarding the effects of moist heat on the biological values of protein, available data do not suggest that the thermal processes employed in canning are likely to affect materially the biological values of vegetable proteins. Since there is no question as to the heat stability of minerals, the influence of canning on these nutrients is confined to mechanical separations, leaching effects, or possibly changes in availability.

Of the fat soluble vitamins, the provitamins A are the least stable in vegetable materials. Other than a susceptibility to oxidation after maceration of vegetables under conditions which do not inhibit enzyme action, the provitamins A in vegetable products appear to be well retained. The water insoluble nature of the fat soluble vitamins minimizes sacrifices of these factors through leaching during washing operations. Mechanical removal of certain tissues during preparatory operations may, however, influence the vitamin A activity of vegetables as finally eaten.

Of the nutrients in fruits and vegetables, the water soluble vitamins appear to be most susceptible to sacrifice during cannery operations and their solubilities present one avenue by which they may be removed in canning or in ordinary food preparatory operations. The relative heat labile nature of thiamin and the ease of oxidation of ascorbic acid suggest the need for exercise of proper precautions in food preparation or preservation methods to permit maximum retention of these factors.

BASIC STEPS IN CANNING

In the various methods employed for preserving fruits and vegetables, the primary objective is the conversion of perishable, seasonable foodstuffs into staples which can be stored, distributed, and later consumed as desired. Most canning operations, with the exception of filling, permanently sealing the container, and subjecting the product to a heat treatment adequate for commercial sterilization, have their counterparts in ordinary methods of food preparation, and, just as methods employed in the preparation of raw foods for serving may vary from product to product, canning methods may vary from product to product and even cannery to cannery except for the more highly standardized products.

CANNING ACID PRODUCTS—CHIEFLY FRUITS

In broad detail, three general patterns are followed in the preparation and commercial canning of fruits and vegetables. Under one may be discussed the canning of fruits (acid product, with pH values below 4.5) as large discrete particles. In this instance, the raw foodstuff upon receipt at the cannery is subjected to thorough cleaning, including washing, followed by removal of undesirable or inedible materials such as skins, pits, seeds, etc. Depending upon the style of pack, fruits may be subjected to further operations to produce pieces of the desired sizes and shapes. As is gener-

ally known, the prepared fruit in proper amounts along with a suitable packing liquid medium—either a sugar syrup or a fruit juice—is packed into cans. After partial removal of air from the headspace of the can by exhausting, mechanical vacuum, or a steam jet, the cans are permanently sealed. The cans after closing are usually heated at the temperature of boiling water to effect commercial sterilization.

In this sequence of operations, tissues of relatively high or low nutritive values may be removed and the carbohydrates content may be enchanced by addition of sugar syrup. Such effects are, however, frequently similar to home preparation of fruits for serving. The large size of the pieces tends to limit the leaching of water soluble materials from fruits during washing with cold water. Partial removal of oxygen from the can headspace by exhausting minimizes oxidative inactivation or destruction of ascorbic acid. The thermal stability of thiamin below pH 4.5 is such that inactivation of this factor during the thermal processing of fruits is quite low. This is clearly indicated by ascorbic acid values of 152 mg. before and 147 mg. per No. 2½ can of tomatoes after processing; also by thiamin values of 434 μg before and 438 μg after processing the sealed can 50 minutes in boiling water. These data were obtained by studies made during the current season.

CANNING JUICES

In the patterns followed in the production of fruit juices including tomato juice, the general procedure is roughly similar to that employed for canning fruits as large discrete particles with the obvious exception that the fruit is reduced to a juice by some suitable procedure. In the production of juice a definite sacrifice of provitamin A may be encountered in case the pulp of the fruit is not included in the juice. Tomato juice and fruit nectars prepared from fruits containing appreciable quantities of provitamins A are mostly of the pulpy type. Hence the vitamin A activities of these fruit products are quite similar to those of the corresponding fruits.

The retention of ascorbic acid in canned tomato juice or citrus fruit juices appears to be dependent in large degree upon the degree of protection from atmospheric oxygen during extraction and other operations subsequent to closing the can. Under good commercial operating conditions the sacrifice of ascorbic acid accompanying the production of citrus fruit juices is practically negligible. However, in certain commercial operations in which oxygen may be incorporated in the juice during extraction and other operations which contributed to a low final vacuum in the can, definite decreases in ascorbic acid contents may be noted. Our experiences indicate that heat, *per se,* is a relatively unimportant factor from the viewpoint of ascorbic acid retention where reasonable precautions for exclusion of oxygen are observed.

CANNING PRODUCTS WITH pH ABOVE 4.5—LARGELY VEGETABLES

A third general pattern is that employed for canning vegetables (non-acid products with pH values above 4.5) as discrete particles. As in the case of all canned foods, the first steps include removal of extraneous materials by a sequence of cleaning operations. A pre-heating treatment known as a blanch or scald applied early in the canning of vegetables is an important factor influencing retention of nutrients in the finished product. This preliminary heat treatment performs a number of functions such as cleansing, shrinking bulky products so as to permit packing of proper or legally defined amounts of food in the can, expulsion of gases and inactivation of enzymes. However,

exposure to hot water or even steam [5] may in certain circumstances result in a considerable sacrifice of water soluble nutrients through leaching. The extent of sacrifice is dependent upon a variety of factors among which are the type and maturity of the product, time and temperature of blanching, and the blanching medium. Data reported in the literature and substantiated by data obtained in our laboratory indicate that the loss of water soluble nutrients accompanying blanching operations may frequently be as high as 25 per cent. A portion of the water soluble materials in the vegetable pass into the liquid medium or "brine" in which it is customarily packed. This medium is, of course, contained in the can as delivered to the customer and to obtain full benefit of the nutrients which passed into solution, it is essential that this liquid be utilized.

Because of the relatively severe heat treatments used in sterilizing vegetable products there has been a tendency to regard the sacrifice of ascorbic acid and thiamin during thermal processing to be exceptionally high. In reality, under commercial operating condition, decreases in ascorbic acid accompanying the thermal processing of canned vegetables do not appear to be as great as many have indicated. Data obtained during the past season show that peas containing 82 mg. of ascorbic acid per No. 2 can (solid plus liquid) prior to processing retained 79 mg. per can after processing 35 minutes at 240° F. Ascorbic acid values per No. 2 can of cut green beans were 48 mg. before and 43 mg. after processing 20 minutes at 240° F. In the case of thiamin it is well established that partial inactivation of thiamin is to be expected during thermal processing of vegetables. However, published thiamin values for canned vegetables [2, 6] indicate that the thiamin retention in canned vegetables may be rather high. Here again studies made during the past season show that peas containing 960 μg of thiamin per No. 2 can as filled retain 590 μg per can after processing 35 minutes at 240° F. Non-processed cut green beans containing 210 μg of thiamin per No. 2 can retained 170 μg of thiamin after processing 20 minutes at 240° F.

The nutritive values derived from canned foods are influenced by the conditions under which they are stored. Although supporting analytical data are rather limited, it appears as if the vitamin contents of canned foods are well retained at usual room temperatures during periods consistent with common marketing practices. At higher storage temperatures (98° F.) the losses of ascorbic acid from at least some canned foods may be markedly accelerated. Hence, the storage of canned foods in cool places as is customarily recommended is to be desired.

The treatments which foods receive in the kitchen may also be important factors influencing the dietary values of canned foods as consumed. As suggested, the practice of utilizing the liquids as well as solids in the can pays good dividends in the form of water soluble minerals and vitamins. In fact, the concentration of ascorbic acid and thiamin in the liquids may equal or exceed that in the solids portions. Canned foods have been thoroughly cooked during production and require only a minimum of reheating after opening. It is therefore suggested that in case the food is to be served hot the solid portion of the vegetable be heated only to the desired temperature for serving.

CURRENT NUTRITION STUDIES

Detailed information regarding the nutritive values of canned foods and the effects of cannery operations on the nutrients in foods is still to be considered inadequate. However, during the first half of 1942 some 850

samples * comprising 28 fruits, vegetables, and marine products canned in the major producing areas have been assayed for provitamin A or vitamin A, ascorbic acid, thiamin, riboflavin, niacin, and pantothenic acid. In a special research program,* the distribution between solids and liquid in the can of thiamin, riboflavin, and ascorbic acid has been studied for fruit and vegetable products, and the effects of food preparation methods on these vitamins in canned vegetables have also been investigated. The results from this program already have been made available to the Armed Forces through the Food Composition Committee of the National Research Council. Publication of these data by the collaborating university groups is projected for the near future. The proximate composition and mineral contents of these 1942 samples are still under investigation at this time. Although this phase of the study is not completed, a substantial number of samples of the various products have been analyzed.

This program is also being continued during the current year, with the total number of samples scheduled for analysis somewhat curtailed. However, the program has been expanded to study the effects of cannery operations on retention of nutrients of the raw stock in the finished products. Such studies are being conducted in the field, working with materials as they are routinely handled in canning lines during commercial production. Data obtained from this phase of the program should assist in establishing more precisely the extent of sacrifices of specific nutrients during canning, and indicate possible improvements in the operations associated with such sacrifices. It is anticipated that results obtained from these studies will point the way to the production of canned foods with even higher nutritive values.

* Sponsored by the National Canners' Association—Can Manufacturers' Institute.

SUMMARY

The energy, carbohydrate, protein, and fats derived from canned fruits and vegetables may be considered as being of slight nutritional significance. The chief nutritive values of these foods are associated with the vitamins and minerals they contain. Canned citrus fruits and tomato products are among the more valuable dietary sources of ascorbic acid. The provitamins A contained in canned leafy green and yellow vegetables constitute a major source of vitamin A activity in our diets. More concentrated food sources of the B vitamins and minerals are not found among the fruits and vegetables either fresh or canned. However, many canned fruits and vegetables contain important quantities of niacin, thiamin, riboflavin, calcium, phosphorous, and iron, nutrients which many diets supply in suboptimal quantities. Certain differences in nutritive values found in different canned products are discussed.

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Sanitary Engineering in Latin America*

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THE scope of the sanitary problems which now confront the engineers of the Western Hemisphere is impressive; yet problems of greater magnitude and variety will surely be presented as air transportation, the Inter-American Highway, post-war economic relationships, and other developments bring the peoples of the western hemisphere more closely together physically, economically, and politically. More rapid communication, and the failure of disease to recognize political boundaries, are making sanitary problems, which were formerly confined to isolated areas, potentially common to most of the western hemisphere.

The western hemisphere has been undergoing a "sanitary awakening" which has paralleled economic developments. It took root and grew rapidly first in North America; that it is now growing among the peoples of the other American republics is evidenced by the inclusion of sanitation as an important part of their plans for future development. Future sanitary developments in the Americas will be expedited and facilitated by a close coöperation and understanding between engineers and other health workers, thus paving the way for an exchange of personnel, information, and experiences.

* Presented before the Engineering Section of the American Public Health Association at the Seventy-second Annual Meeting in New York, N. Y., October 14, 1943.

HEMISPHERE COÖPERATION IN SANITATION

International coöperation on public health problems has been sponsored by the International Health Division of the Rockefeller Foundation for almost a generation. This organization has demonstrated in many countries the social and economic desirability of sanitary projects. In addition, it has fostered the training of medical, nursing, and engineering personnel of the coöperating countries by bringing students to the United States and other countries for education and experience.

The Pan American Sanitary Bureau, which was formed by treaty between the American republics, has supported training programs for the development of talent in the field of sanitation. By providing advice, literature, and education to all the countries of the Americas its able field staff has done much to further sanitation on a hemispheric scale. The Pan American Sanitary Bureau is the product of true inter-American coöperation in which all countries are represented in a common program to improve public health in the Western Hemisphere.

At a conference of the foreign Ministers of the 21 American republics held at Rio de Janeiro in January, 1942, plans were made for a polyphase program of coöperation for the purpose of (1) greater development of the economic resources of the Western

Hemisphere; (2) the control of anti-American activities in the American republics; and (3) hemispherical defense of the Americas. The conference proposed that individual or coöperative action be taken to deal with problems of health and sanitation in the hemisphere, and suggested that such action should be undertaken in accordance with the ability of the different countries to provide raw materials, services, and funds.

Because of the necessity for quickly utilizing the resources of the Western Hemisphere, and for providing adequate hemisphere defense, both of which require health and sanitation operations to protect the people of tropical regions against the hazards of their environment, the difficult task of planning a coöperative program was immediately undertaken. The urgency of the program, its coöperative aspects, and the financial problems, made it necessarily a federal government project. In the Office of the Coördinator of Inter-American Affairs there was established a Division of Health and Sanitation, under the direction of Major General G. C. Dunham of the Army Medical Corps, who had had wide experience in health and sanitation work in both hemispheres. A corporate medium, the Institute of Inter-American Affairs, was created to serve as the legal entity for conducting the program.

At the present time coöperative health and sanitation programs are under way in 18 of the Latin American republics. The work includes construction and initial operation of hospitals, health centers, and dispensaries; development and rehabilitation of water supplies; construction and extension of sewerage systems; malaria control through drainage, larvacidal operations, and atabrine distribution; education of medical, engineering, and nursing personnel, and education of the public in health. The health program in the respective countries is carried on as a coöperative service, usually called "Servicio Cooperativo Inter-Americano de Salud Publica," and is a part of the government of the host nation. All authorizations for projects, and matters of policy, must be approved by a representative of the host government and by the Chief of Party who serves in a dual capacity as Director of the "Servicio" and representative of the United States Government. The Chief of Party is either a physician or a sanitary engineer. As far as possible the "Servicio" is staffed with national personnel; the Institute of Inter-American Affairs provides the necessary North American personnel for supervision and technical guidance. The basic Institute or United States personnel are a physician, an engineer, and a business manager, although it is usually necessary to have a larger field group.

Both of the coöperating governments contribute to the costs, and a definite plan is made for the host government steadily to increase its financial support and for the Institute of Inter-American Affairs to decrease its contributions until the host government completely takes over the public health program. Plans were made for the Institute to assist in developing national professional personnel to take over the health and sanitation work as soon as practicable. Since the final success of any public health program depends upon the caliber and number of qualified personnel in the country, the Institute, therefore, is sponsoring training in the United States for medical, engineering, and nursing personnel who are devoted to their country and the cause of public health. As national personnel become qualified to carry on the work, the Institute men are removed. Thus, in addition to the part played by health and sanitation in the development of the economic resources of the hemi-

sphere and the defense of the Americas, the level of health and sanitation in the Americas will be raised. As the plan is now conceived, each host government will have qualified personnel to carry forward the long-range public health programs.

STATUS OF SANITARY ENGINEERING

Although in some parts of the Western Hemisphere sanitary engineering is a young but growing branch of the engineering profession, there are still many places where it grades through childhood and infancy to the embryonic stage. In the United States the sanitary engineering profession has developed rapidly during the past 25 years, until it now contributes an important part to all public health and public works programs. The progress and growth of the profession in Latin America has been less rapid. Nevertheless, one may see in the other Americas some fine engineering works and will meet there many very able engineers. Some countries have excellent sanitary engineering staffs in their health departments. In general, however, sanitary engineering is just getting started and has not yet played an important part in public health work. Reasons for this are: first, public health has only relatively recently received emphasis in social thinking; and second, there is a great scarcity of engineers in Latin America and they find higher salaries in private work and branches of engineering other than sanitary. The increased economic development, including building, transportation, and industrial expansion, in which the engineer has taken a leading part, has allowed little professional interest on the part of engineers in sanitary work. Because of this situation, the educational institutions and the authorities responsible for public health are not familiar with the rôle and functions of the sanitary engineer. Hence, there has been neither much demand for, nor promotion of, the profession. When a few sanitary engineers have been trained, the results of their work and their very presence will encourage and further the development of the profession.

The social status of the professional engineer in the other Americas is very high. On graduating from an engineering school, he receives the Doctorate title. However, he prefers to be called engineer. In general, the salaries of engineers in the other American countries are the highest of the professions. Latin American engineers have a background of experience which could well be exchanged with North American engineers to their mutual advantage. North American engineers working in the other Americas often find methods and practices which are not consistent with their experiences. Before deciding that theirs are better, they should carefully investigate the reasons for the practices, because often there is validity in the practice. There are registration boards for professional engineers in many Latin American countries which require that foreign engineers must become registered in order to practice in the country. Hemispherical coöperation in the engineering profession will increase the contribution of the engineer to society.

SANITARY ENGINEERING WORKS

1. *Water Supply and Purification*— For several years the United States has had standards of water quality which have been the accepted measuring stick throughout the country. In Latin America such standards for water quality have not yet been used on an extensive scale largely because of the shortage of sanitary engineers in health work.

Although there are public water supplies in Latin America of which many comparable North American cities would be proud, the development of

safe clean water supplies remains the most critical sanitary problem confronting the other Americas. Many relatively large cities do not have safe water and many smaller cities have as yet been unable to develop a public water supply. Boiling of the water is the accepted precaution used by people who are familiar with the hazards of contaminated water. As well as being a health problem, water supplies in many areas are a very important economic problem. Communities are built on streams which are often the avenue of transportation. In some places the poorer people must spend two hours or more early in the morning carrying the day's water requirements from a polluted stream before they start the work which earns their livelihood. The streams, as well as being the source of water, are often the public laundry and the natural channels for waste disposal.

Slow sand filters have been used more commonly than the rapid type because of the high cost of chemical coagulant and the need for simplicity of operation. North American water plant design practice is probably as common as European practice, although European equipment is used more extensively. Because of the shortage of chlorine, chlorination equipment and shipping facilities, only the large cities are able to chlorinate their water supplies adequately. The maintenance of a desirable residual throughout the distribution system is uncommon. The pipe sizes in distribution systems are generally smaller than those used to serve cities with populations of similar magnitude in North America. One reason for this is that fire protection is less important in the unheated buildings of the warmer climate. Fire protection is not needed for the better class of buildings which are constructed of concrete, brick, and tile, and it is cheaper to replace the poorer class buildings than to protect them. The pressure carried in the distribution system is lower than is common in North America. The low pressures and poorly maintained distribution system are often responsible for contamination of water which may have left the treatment plant clean and safe. Because the demand for water often exceeds the capacity of the system, the water is turned off during the night. Consumer pumping creates low or negative pressures and serious contamination of the mains. Cross-connections are a very serious source of contamination of water supplies in many cities. Since water meters are not often used except for large consumers, there is considerable waste of water.

Hydrological information on stream flow or on ground water sources is very limited. Ground water will no doubt prove to be the principal source of supply for smaller cities. Future plans of several American countries include investigation and development of ground water. A sincere, keen interest in safe water supplies exists in the Americas. In many places supplies are projected for construction as soon as materials and equipment become available. The writer believes that the post-war period will witness rapid progress in water supply development in the other Americas. Financial problems in small cities and the inability of the consumers to pay the cost of water and service connections will present difficulties. In contrast to public water supplies in North America, which often started from a small beginning and were expanded from earning and short term loans, many Latin American cities that have no public water supplies will have to finance a large initial outlay. These difficulties may be offset by the fact that in many countries there is centralized government control of the planning and financing of public works.

2. *Sewerage and Waste Treatment*— Except for large cities in the other

Americas, there are few facilities for the sanitary disposal of excrement. Even latrines and privies are uncommon in the poorer areas, and the incidence of intestinal diseases in these areas is therefore very high. Sanitary disposal of excrement is a primary health problem in many places and must be accomplished before hookworm and other intestinal diseases can be controlled since the people are immediately reinfected after treatment.

Since the development of sewerage facilities usually parallels or follows water supply development, only the larger cities are sewered. Although there are some good sewage treatment plants in Latin America, sewage treatment is the exception rather than the rule. Large cities are generally located on the coast or on streams where sewage disposal without treatment is satisfactory. In these areas it is doubtful that sewage treatment will make very rapid progress. In the arid coastal regions of western South America, where every drop of water is valuable, sewage is discharged into irrigation ditches. The incidence of intestinal diseases is usually high in these localities. Since irrigation with sewage is an economic necessity, many treatment works are being planned and, in the future, the treatment of sewage will probably be standard practice in this area. It is believed that the use of mechanical equipment in sewage treatment has been overdone in North America, and that it will be used less extensively in the other American republics as their sewage treatment program develops. Design practices for sewage treatment in Latin America will differ from those in the United States because of the climate, and the quality and quantity of wastes.

3. *Refuse and Garbage Disposal*—Land-fill is the most common method of garbage disposal in the other Americas. Excellent progress has been made with the use of sanitary land-fill in several places. In others the garbage dump becomes a breeding place for flies and rodents and a feeding ground for scavengers. The garbage and refuse is usually fairly dry, and the quantity per capita is much less than in the United States. While incineration is used in many places and may be used almost as satisfactorily as in the United States, it is not as economical as sanitary fill. Sanitary fill, in addition to being a method of disposing of refuse, can be used for reclamation for low-lying lands and filling swampy areas which are foci of mosquito breeding. In fact, sanitary fill may be operated more satisfactorily in most of the Latin American countries than in the northern part of North America because of the more or less uniformly warm climate.

4. *Mosquito Control*—The control of mosquito-borne diseases, particularly malaria, is probably the greatest health and sanitation problem in the tropical and semitropical areas of the Western Hemisphere. Malaria control assumes great economic importance in the development of natural resources. Air transportation has greatly increased the possibilities for spreading the different malaria vectors from one area to another. Also, the other mosquito-borne diseases such as yellow fever, dengue, and filariasis, which exist in scattered areas throughout the hemisphere, may be spread by the air transportation of infected mosquitoes. Considerable information is now available, and new data are being gathered on the identification, distribution, and biology of the different malaria vectors in the Americas.

In the other American republics sanitary engineers have had a very small part in mosquito control activities. Mosquito control, including drainage, larvacidal spraying, screening, etc., is usually conducted under the direction of a physician who has a staff of inspectors. This system has operated

fairly satisfactorily for temporary control, but leaves much to be desired in permanent control and drainage.

Drainage and filling are probably the most effective means of controlling the malaria around large cities in Latin America. Drainage ditch lining with precast concrete is practised extensively. The Panama invert is used most commonly in Central America while in South America the one-half or one-third precast concrete pipe invert is used. In El Salvador vitrified clay Panama inverts have been installed satisfactorily and very economically. Mosquito control by fluctuation of the water level through the use of dams and siphons has been practised satisfactorily in Bolivia. However, in rural areas, or places where the topography is adverse, drainage may be much too expensive.

Screening is very important in semi-tropical rural areas where the houses can be efficiently screened, but it is not effective for thatched and mud wall huts. In the future, economical and efficient use of mosquito repellents may be found to be helpful in controlling mosquitoes under conditions where drainage and temporary larvacidal operations are unsatisfactory. Since mosquito-borne diseases are closely associated with climate and topography, and since improvement of environment is an important method for lessening the mosquito-borne diseases, the sanitary engineer's interest in the control of these diseases should be continually increased.

5. *Housing and Slum Clearance*—The field of housing has recently become a public health problem of the sanitary engineer. As the standard of living increases, housing and slum clearance become more and more important. Provisions for improved housing and sanitation are included in the progressive social security legislation of several of the Latin American countries. Excellent results with housing have been demonstrated in many areas. For instance, in Brazil I was impressed by the very interesting plan for slum clearance which has operated successfully. Under this plan, slum and blighted areas are purchased from the owners by the government, and are replotted in accordance with the city plan. After streets and utilities have been provided, the original owners are given the first opportunity to repurchase the property. The increase in the value of the property usually pays for the utilities and streets. Further development of the property in these areas must be in accordance with the city plan.

In Colombia rural housing is carried on by a government housing authority which builds homes for rural families. The cost of the home is amortized by monthly payments over a period of years, and provision is made for cancelling the unpaid balance in case the head of the family dies. Thus the heirs receive the home free of debt. Elsewhere in the Americas plans for providing housing are being and have been carried out successfully.

6. *Industrial Hygiene and Sanitation*—Excellent social legislation designed to improve health conditions of the worker has been developed in many of the Latin American countries. Because of the shortage of labor and increasing industrial development, industrial hygiene and sanitation will be utilized as an economic means of obtaining greater production from their man power. A few countries now have occupational disease control programs. However, at the present time sanitation and general public health appear to be more important than specific control of occupational diseases.

SANITARY ENGINEERING EDUCATION

Education, both for developing personnel in the field of sanitary engi-

neering and for the general education of the public concerning sanitation, is of primary importance in all parts of the Western Hemisphere. During the past decade, in the United States sanitary engineering education, particularly on the postgraduate level, has increased greatly. It would appear that as long as the 4 year program of our engineering schools continues, the major part of sanitary engineering and public health education will have to be given as postgraduate study.

Engineering schools are established in almost all of the other American republics. They are usually housed in good buildings, and have eminent engineers on their faculties. Most of the faculty members are engineers who teach part time and engage in private practice or work for government departments. The engineering curriculum varies between 5 and 7 years in length, but is usually 6 years. Little attempt is made to specialize in different branches such as civil, electrical, and mechanical. Major emphasis in their program is placed on civil engineering. Only a few schools give any training in sanitary engineering, and the majority of the courses deal with water supply and sewerage design. A few universities, notably the National University in Peru, have recently started more extensive training in sanitary engineering as a part of the 6 year engineering course.

In the past French and German textbooks have generally been used, but today North American texts are filling the libraries. A transition is now in progress from the European type of highly theoretical engineering education to the American approach which stresses the practical application of theory. Very little training in environmental sanitation and sanitary engineering is provided in the schools of public health in Latin America. Because of the scarcity of engineers and the failure of schools of public health to include training in sanitation, engineers do not attend them.

POST-WAR SANITARY ENGINEERING

The post-war opportunities for the sanitary engineer to serve humanity throughout the world will certainly not be lacking. Future public works and public health requirements in the field of sanitation and sanitary engineering in the United States will no doubt be large. Industrial wastes and stream pollution control on which considerable planning and study was accomplished prior to the war probably will be undertaken on a large scale in the post-war period.

It is believed that sanitary engineering in Latin America will receive great impetus after the war. There is much sanitation to be done and sanitary engineering, as such, is in an early stage of development in most Latin American countries. Safe water supply, sewerage, malaria control, and general sanitation will be developed as rapidly as is economically possible. Economic development of the resources in many Latin American countries is very closely associated with sanitation, thus requiring progressive sanitation in order to realize the full advantages of their resources.

The services of the engineer can well be utilized in the fields of public health administration and planning. Thus far in the development of public health, we as engineers have generally played a small part in administration and the forming of public health policy. We have tended to remain as technicians in our specialized fields without having sufficient influence on the over-all policies of public health administration. The administrative ability of the engineering profession has been recognized generally in other fields and it is believed that recognition in the field of public health will follow, opening new avenues for the sanitary engineer.

The Case Method in Teaching Public Health Administration

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DURING 1940–1941 the author was engaged upon a general study of the problem of making public health administration a more effective part of the graduate school curriculum in public health. The task is an old one: i.e., an effort to place an applied subject on an equal intellectual footing with older disciplines which depend for their intellectual attractiveness upon the experimental method and the achievements of that method.

After reviewing past experience and current opinion regarding education in public health administration, it was decided that there were available five teaching methods which can be described as follows:

1. The lecture and assigned reading method
2. The seminar method
3. The apprentice method
4. The dig-it-out-yourself method under proper guidance and criticism
5. The case method

Each method has its own advantages; and public health administration may be taught by all of these methods, by anyone, or by any combination. The method or methods selected depend on several factors: the personality, experience, ability, and energy of the teacher; the number of students in the class; the availability of well organized field areas; the relationships between the academic institution and the local or state public health organization.

The *lecture method* is the least satisfactory and perhaps one of the most commonly used methods of teaching public health administration. Indeed, a lecture has been described as "the process by which the professor's notes become the student's notes without passing through the mind of either!" The lecture method certainly has its place. For the instruction of large classes, for the presentation of certain historical data, for descriptive analyses, and in providing general background for other types of study, it is essential. It is probably the easiest method for the professor, because he can prepare his lectures and, if he is so inclined, read them to the students year after year with minor changes. From the viewpoint of the student, the lecture and assigned reading method tends to place more emphasis and a higher premium on memory and knowledge of the lecture notes than on cerebration and critical analysis.

The *seminar method* is less formal: it allows for an exchange of ideas between the professor and student and, more important, permits student participation in the development of an idea or a subject. This method is used extensively in schools of public administration. Its disadvantages are that it works successfully only in small groups, preferably not more than ten, and that the professor has to possess the particular ability to incorporate

the student's ideas and approaches into his teaching; for, unless expert guidance is given to the seminar, all hope of a systematic discussion of a topic is lost.

The *apprentice method* is claimed by many to be the only method by which administrators may be trained. Persons of this belief feel that the qualities needed by a successful administrator can be developed only in the face of the necessity of making clean-cut decisions, and that any other type of training is vicarious, sterile, and nonproductive. It is perfectly true that other professions, such as medicine, have found that even an extended period of classroom and laboratory experience does not produce a finished product, and that a period of apprenticeship or internship is required before the student is capable of practising his profession. A period of supervised employment of students after completion of a graduate academic year would undoubtedly be of value in the development of public health administrators, but the actual inauguration of such training, except in a few localities, has been deterred by many factors. Because of the present shortage of personnel, state health departments or other agencies sponsoring public health fellowships are anxious to have the student return to his regular appointment as soon as possible after completion of the academic year. Once the student returns to his job the school has little opportunity to exercise any control or supervision over his activities, and frequently the health department is more interested in his immediate usefulness than in his continued development. The average local or state health department is not prepared to take interns for short periods and integrate them into their regular program activities, sharing the supervision of the intern's program with the university. Frequently the intern serves only as an interested observer instead of an integral part of the organization, and too great a variety of experience is arranged.

The *dig-it-out-yourself* method under competent guidance is probably the most effective teaching technic and is the exact opposite of the lecture or "spoon-feeding" method. When taught by this technic, the student is assigned a problem and it is up to the individual to orient himself, set up his hypothetical questions, accumulate his data, analyze them, and propound possible solutions. This method usually establishes an intimate bond between the student and his faculty adviser, provides opportunity for wide reading, and frequently extensive field contacts. However, the students of public health administration could undertake only a few problems in the course of an academic year, as this method of learning is most time-consuming and is usually reserved for the advanced student who is a candidate for the degree of Doctor of Public Health.

It is the object of this brief communication to discuss the *case method* and report on a single experience which seems worthy of record.

Case study is not new. It originated in the Harvard Law School and has extended through law schools into schools of business administration and more recently into the field of public administration. In a sense this method has always been used in teaching medicine. Since the days of Hippocrates, students of medicine have learned to manage the patient of today through consideration of the history, examination, and progress of the patient of yesterday as his condition was unfolded by the successful medical teacher.

The success of the case method in the teaching of law would seem to depend on the fact that to solve a given problem the student has to use his knowledge and his independent

ability in marshalling decisions and precedents which apply to it. In many respects this is the experimental approach. The student is confronted by a question which he answers by a more or less competent use of his past experience. Similarly, in medicine the student confronted by a problem in diagnosis and treatment must, to reach his conclusions, resort to his memory of previous patients, reinforced by his knowledge of chemistry, bacteriology, and pathology.

In defense of case studies as used in other branches of education, the following quotations are cited:

Wallace B. Donham, Dean of the Harvard School of Business Administration, states: "The failure of both business and political leadership to rise to the heights needed has its roots, I believe, in the failure of our universities to prepare men broadly for the world of affairs. The only way these things can be attempted in our universities without resulting in a vast amount of unrealistic sentimentality is, I believe, by paying more attention to the great intellectual field of administration. The theory and action must meet; their decisions must be efforts to do the best one can under all the circumstances. The administrator must integrate, decide and act—the one way to train men for administration is by the case system and, so far as I know, there is no other classroom method which impels students to go through the mental processes involved in administration." [1]

Professor George Graham has made the following comment: "Three factors lay at the root of the case system's development. One was the conviction that administration was essentially the solution of successive problems; that the administrative process was one of gathering all relevant information bearing on the problem, making decisions and carrying them out. The second factor was the demand for a device to interest and stimulate the active, extrovert type of student who had ample energy, but not too well developed study habits. The third factor was the desire to avail students of all fields of knowledge relevant to their problems regardless of existing lines of university organization. The case is thus a practice problem, a disciplinary device, and a means of integration." [2]

William E. Mosher finds even greater implications in the case system as a research method: "Case studies, in and for themselves, may have some suggestive value, but unless they cover systematically and comprehensively all possible variations with respect to one or another feature or problem no generalization can result. It is the hope of establishing generalizations, of discovering dependable and predictable relationships and sequences that ever beckons the scientist on. He believes that there is order in the universe and has confidence that through patient inquiry, painstaking observations, and the reasoning process of the human mind this order may be discovered." [3]

On the basis of these opinions it was decided during the second semester of the academic year under consideration to try out the case system in connection with the teaching of public health administration. Following the outline of case studies of the Committee on Public Administration of the Social Science Research Council, the students were asked to prepare case studies drawn from their own experiences. This work was done on a voluntary basis, and the presentation and discussion of the cases took place in the evening.

THE EXPERIMENT

The following plan for an exercise using the case report method was submitted to the students:

1. Each student is requested to describe a problem in public health administration (ac-

tual or hypothetical) that has been of interest to him.

2. These will be submitted to the faculty of the department of public health practice and the best and most illustrative cases will be selected for class discussion.

3. The case reports selected will be duplicated and distributed for consideration by the students prior to the meeting.

4. The faculty and students will discuss each case presented and attempt to arrive at a decision.

OUTLINE FOR WRITTEN PRESENTATION OF A CASE REPORT

Title: The title should be short and give the general idea of the material covered, e.g., "Selection of Temporary Personnel."

Statement of the Problem: This should be brief and to the point.

Relevant Facts: Give as much background as is necessary to enable the group to outline possible decisions and select a course of action.

The Results: Do not include the decision which was made in the situation discussed or the results of the decision. This will be left for faculty and student discussion.

Twenty-five cases were submitted by the students. These were read and the most illustrative selected, edited, and duplicated. Because of the limitations of time only 8 cases could be selected and only about 15 minutes allowed for presentation and discussion. Four students were assigned to discuss each case. The titles of the 8 cases were as follows:

1. Promotion of a Staff Member on Basis of a Civil Service List
2. Development of an Esprit de Corps in a Disorganized Health Department
3. Direction of an Antagonistic, Politically Strong Bureau Chief
4. Local Public Relations
5. Disciplining of Subordinate Staff Member for Aggressive Self-promotion
6. Selection of a Location for a Health Department
7. Public Relations Involving the Medical Society and County Supervisor
8. Coördination of Activities of a State Health Department to Avoid Duplication of Field Visits

Two cases which are fairly typical of those submitted and which gave rise to the most heated discussions are included here as examples. That the students expressed interest in these problems need not be doubted.

Case 6

Title: Selection of a Location for a Health Department.

Problem: Should the offices of a county health department be located at the county seat or in another city offering greater conveniences?

Relevant Facts: A county health department is to be organized in a county of 20,000 persons in which there are two principal towns, A and B. A, the county seat, has a population of 800 persons and is situated near the southern border of the county. There are two physicians practising in A—an older man over 65 years of age, who has been hostile to the proposed health department, and his assistant, who is 4 years out of college. The only building in A with central heating is the courthouse, in which there is no space for the health department.

Town B has a population of 7,000 persons and an additional 5,000 are to move in shortly to work on a dam, which is to be three miles from Town B. Six doctors practise in B. Three of them have a successful clinic and a 15 bed, closed hospital. Dr. M, the organizer of the clinic and hospital, has previously opposed the health department. The County Court having now authorized funds for the health department, Dr. M pledges full support and offers to build a $10,000 building on a site one block from his hospital and four blocks from the main street of the town. He proposes to rent this building to the health department for $30 a month. The three other physicians in B are lukewarm toward the health department and hostile toward the clinic group headed by Dr. M. Because of the influx of dam workers, office space is at a premium in Town B.

There are four other physicians in the county. One who lives 5 miles from Town A is violently opposed to the health department; he has not the professional respect of the other physicians. The remaining three physicians, who live within a radius of 10 miles of Town B, have pledged their support to the health department. Town B is located near the geographic center of the county, 20 miles

north of A. The budget is slender and has been appropriated for one year only. The Court has pledged support for a permanent health department if the experiment is successful. The county officials want the health department in Town A. All the physicians, with the exception of three, have signed a petition that it be in B.

Questions: Should the health department be located in Town A, the county seat, or in Town B?

Should Dr. M's offer to construct a building for the health department influence the decision?

Case 7

Title: Public Relations Involving Medical Society and County Supervisor.

Problem: What action should a local health officer take when an influential member of the County Board of Supervisors requests the violation of a policy established by the local medical society?

Relevant Facts: For a period of ten years or more the health department of a county situated in a southern state had been administering rabies vaccine without charge to any residents exposed to rabies. Recently a member of the local medical society objected to this practice. He contended that the health department should do only work which affected the health of the public and that rabies endangered the public in no way. He cited the fact that the health department did not administer tetanus antitoxin.

The matter was brought up before the medical society for discussion and the society went on record by a unanimous vote to request the health department to discontinue the administration of rabies vaccine, and further unanimously agreed that they would administer all necessary vaccine, charging a fee for those able to pay and giving it free to those unable to pay. The medical society assured the health officer that no one needing treatment would be deprived of their services and the health officer agreed to abide by their request.

Two weeks later, a local woman came to the office and requested rabies vaccine, having been bitten by an apparently rabid dog. The health officer explained to her the arrangement with the local physicians and she left the office. That evening the oldest member of the County Board of Supervisors (who are responsible for health department appropriations) called and asked the health officer to give the woman rabies vaccine. The supervisor stated that he would telephone to the state health officer if the local health office failed to comply with his request. In the state in question, local health departments are under the direct supervision of the state health department.

Questions: What course should the local health officer follow at this point? Remember, he must make an immediate decision while talking on the phone with the supervisor.

What could have been done to prevent such a situation (a) at the time of adoption of the policy, (b) at the time of the woman's call at the health office?

After the case had been presented by the author the three students assigned to discuss the case expounded their ideas, an effort being made to obtain as many divergent viewpoints as possible. The author then told the actual decision that had been made in the case and the results, and during the remaining time the problem was thrown open for discussion by the entire class and faculty members present.

In the first case above described, the students who had had some experience with political organizations and county health service, maintained that the headquarters of the health department should be located in town A with the other county offices; while students with somewhat less experience held that the best service could be provided for the greatest number by locating the health service in town B. The class was nearly unanimous in agreeing that Dr. M's offer should not be accepted. The decision actually made was to obtain one room in the courthouse in town A which was considered the headquarters, and establish in a rented house in town B a branch health center.

In the second case described the discussion centered more on criticism of the health officer for allowing such a situation to arise than in a discussion of the possible solution.

The reaction of the students to these problems was enthusiastic; in fact, the most serious difficulty encountered was in attempting to limit the discussions

to the time available. Discussion of some of the cases was carried on among the students outside the classroom for some days after the exercise. It was observed that several students who had taken little or no part in classroom discussions defended with considerable ardor their viewpoints regarding the cases. In some instances students cited material learned during the regular course in analyzing situations, indicating a desirable integration between theory and practice.

It should not be understood from the foregoing discussion that the writer feels the case system is the *sine qua non* for the teaching public health administration. It is only a valuable aid. Education is not accomplished merely by having a problem to solve. Before the student can use case reports effectively, he must have a broad general knowledge of his field. This the case system does not provide. The case system may be very valuable in developing the capacity for decision in students and teaching them the tricks of administration, but it is no substitute for a thorough knowledge of the theory, principles, and philosophy of a subject. Teachers of administration must in some way find the golden mean between theory and precedent on the one hand and cases and cleverness on the other. Used alone, the case system would not produce the type of administrators that the schools of public health are anxious to turn out. Used as an adjunct to other methods of teaching, it might do a great deal to improve the interest and content of the present courses in public health administration.

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The Epidemiology of Cancer

From the Viewpoint of the Health Officer*

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ACTIVITIES in cancer control by public health agencies need not and usually do not rest upon the recognition of any epidemiological peculiarities of the disease, in the strict sense of that term. The necessity for persuading people who have symptoms to seek medical care without delay, as well as the desirability of making it easy for them to secure prompt diagnosis and adequate treatment, are sufficiently well defined to furnish a secure foundation for public health action. It is recognized that to accomplish these objectives with some degree of completeness is an undertaking of considerable magnitude, particularly if all persons who reach adult age must be included in the scope of the cancer program.

Because the task of reaching the entire adult population with any type of control measure is manifestly great, the health officer who plans a cancer control program seeks to make the limited forces he can throw into the field count for more than may be expected of random action directed to the public at large. From experience in the control of infectious disease it is evident that information regarding what people are most apt to develop cancer or certain kinds of cancer would be of value in the application of cancer control measures. The health officer who is interested in cancer control must also take stock of the modern advances in the etiology of cancer and inquire whether these now have any practical significance in the control of human cancer.

To review broadly the salient features regarding the occurrence of cancer in man, the facts to be considered may be classified under four general headings: (1) environmental or exogenous agents causing cancer; (2) the association of cancer with other diseases; (3) evidences regarding intrinsic or constitutional factors affecting cancer incidence; and (4) certain aspects of differential mortality.

It should be stated at the outset that cancer of different parts of the body and of different pathological character in the same part are different diseases. Although for some purposes it is useful to consider all types of cancer together, throughout this discussion differences in etiology and in epidemiological features according to *site* of cancer will appear.

EXOGENOUS AGENTS CAUSING CANCER IN MAN

Attention in the laboratory investigation of cancer is now focused on the rôle of chemical carcinogens, and of x-ray, radium and ultra-violet radiation in the causation of malignant

* Presented before the Health Officers Section of the American Public Health Association at the Seventy-second Annual Meeting in New York, N. Y., October 12, 1943.

tumors. In human cancer such agents have been identified chiefly in the small group of occupational cancers. The first such observation was made in England in 1775 by Percival Pott [1] who noted in chimney sweeps a greatly increased incidence of scrotal epithelioma, caused by exposure to soot or some chemical contained in soot. The substances or agents now known to cause cancer in man include arsenic, tar, pitch, paraffin, petroleum oils and derived products, benzol, aniline dye compounds, roentgen rays, radium rays and ultra-violet rays, possibly asbestos, nickel carbonyl and chromates. What common property of these diverse chemicals and radiations makes them potentially carcinogenic is not clear; possibly all act by interfering with cellular enzymes, as the work of Rhoads [2] suggests. Most of these agents produce skin cancer. Aniline dye compounds cause chiefly cancer of the bladder; excessive exposure to radium salts has been known to cause bone sarcoma and carcinoma of the lung; leukemia may follow chronic benzol poisoning. With but few exceptions, the carcinogenic effect of these agents has been demonstrated in experimental animals as well as in man.

A survey of occupations listed [3] according to exposure to various hazards shows 146 different occupations in this country in which exposure to known carcinogenic agents may occur. However, the number of reported occupational cancers is quite small. Hueper [4] estimates that the total cases reported in the world literature is from 8,000 to 9,000, of which approximately 400 have been reported from the United States.

A partial explanation for the small number of reported cases of occupational cancer may be the fact that, although the period of exposure necessary to produce cancer may be as little as one year, the time from such exposure until the appearance of the tumor may be as long as 30 years, averaging for some agents approximately 16 years, so that the tumor may not appear until long after the worker has changed his occupation. There is also a natural reluctance on the part of industrial management to release information on occupational cancer. Although preventive measures, including periodic examinations, have been adopted in some plants, especially in the aniline dye industry, often the hazards are not recognized or not properly guarded against. Exposure to aniline dye compounds occurs not only in the dye industry but in many others, including plants handling rubber and those manufacturing explosives. It is probable that the number of occupational cancers is greater than indicated by identified cases and that the enormous expansion of certain industries may further increase this number in the future.

Obviously, exposure to the carcinogenic chemicals and radiations need not be occupational. Arsenic cancer of the skin has been observed following prolonged medicinal administration of Fowler's solution and, in the Argentine, from drinking water contaminated by arsenic ores. The influence of ultraviolet radiation is believed responsible for the higher general incidence of skin cancer in the South as compared with the North in this country, as well as for its high incidence among outdoor workers in the North.

The relationship of carcinogenic chemicals and radiations to the common run of malignant tumors in man is a matter of speculation. It has been suggested that part of the increase in cancer mortality of modern times may be attributable to the increased exposure to such substances accompanying the industrial age. The difficulties in the way of testing such a hypothesis may be appreciated from the fact that a chemically induced

tumor does not differ histologically from one arising in the same organ apparently spontaneously, and that such a tumor may appear long after the chemical agent has been eliminated from the body.

We may anticipate that a great deal of future investigations on the causes of cancer in man will center on the possible presence of chemical carcinogens in food, water, and dust. Although the significance of the known carcinogenic agents in the etiology of the vast majority of human cancers is at present unknown, continued medical observation of workers exposed to carcinogenic agents, even after they have left the employment where such exposure occurred, is clearly indicated. This is rarely done now and presents a field for possible public health action.

DIFFERENTIAL CANCER MORTALITY AMONG SOCIAL-ECONOMIC GROUPS

In addition to the small group of identified occupational cancers, a considerable array of statistical evidence points to increased mortality from certain forms of cancer in those economic groups among which industrial workers are largely found.

Stevenson [5] analyzed cancer mortality statistics for males in England and Wales on the basis of social-economic class, dividing the population into professional workers, skilled workers, unskilled workers, and two intermediate groups. A progressive increase in cancer mortality was found in each " lower " social-economic group. This increase was confined to cancer of the skin, lip, larynx, and the alimentary canal from mouth to pylorus. For these sites, the standardized rates in unskilled workers was twice that of professional workers. In married women, classified by husband's occupation, a similar though less marked relationship appeared for the same sites of cancer and also for cancer of the uterus, indicating that factors other than those due directly to occupation must be considered in explaining these facts. In married women also, a reverse relation was found for cancer of the breast, ovary, and thyroid, in which the higher rates were in the higher classes. The same differences appeared among single females, classified by social-economic status.

In this country, broadly similar findings have been reported by Knight and Dublin [6] in life insurance data, and by Whitney,[7] for total cancer not subdivided according to site. In Massachusetts, Lombard and Doering [8] found that the foreign born and those of foreign parentage had higher mortality rates for buccal cavity and stomach cancer, but not for other sites. They concluded that a sufficiently close relationship exists between these nativity groups and the lower social classes of England to justify the opinion that economic social conditions are a factor in the incidence of cancer. It is of interest that the first analysis of cancer mortality by economic status in this country was made by Charles V. Chapin [9] on the mortality returns of Providence, R. I., for 1865. He found the rate twice as high in the lower as compared with the higher economic class.

Greater diagnostic accuracy in the medical care available to the higher income groups does not readily explain these differences in cancer mortality in social classes for the reason that better diagnosis increases rather than decreases the total number of recorded cancers. Also the types of cancer in which the differences are found include both easily diagnosed sites, such as the skin, and poorly diagnosed sites, such as the stomach. Moreover, one of the most accurately diagnosed forms of cancer, that of the breast, shows opposite social selection to that observed for almost equally easily diagnosed sites, such as the lip, the buccal cavity,

and the uterus. Better therapeutic results might explain lower mortality from skin and lip cancer in the higher economic groups, but not lower mortality from esophageal and stomach cancer, and certainly not the higher mortality from breast cancer in these groups. The differences in cure rates for stomach cancer in the best clinics as contrasted with the average would be insufficient to account for differences in cancer mortality as pronounced as those observed.

The findings with respect to the higher cancer mortality in unskilled and industrial economic groups are frequently cited as evidence that the living conditions of these groups involve greater exposure to "exogenous carcinogens." Aside from specific occupational carcinogens, we are unable to identify what these agents may be.

Regardless of the explanations for the higher mortality from certain forms of cancer in unskilled and industrial workers, the need for concentrating attention on such groups in applying cancer control measures is evident.

ASSOCIATION OF CANCER WITH OTHER DISEASES

It has long been noted that cancer occurs more frequently than normal in tissues the seat of the so-called precancerous lesions. The evidence for significant association is often far from conclusive. Precancerous lesions have been described in the skin, lip, liver, mouth, bones, thyroid, gastrointestinal tract, breast, ovary, uterus, and vulva. The greatest number have been described in the skin, where at least twenty-two different precancerous states are said to occur.[10] It should be noted that in most cases of cancer, a specific precancerous lesion cannot be identified.

The subsequent incidence of cancer in persons with precancerous lesions varies greatly, from a few (xeroderma pigmentosum; erythroplasia of Queyrat) in which cancer always supervenes, to many in which it is only an occasional occurrence. For the most part, figures which are reported refer not to secondary incidence but to frequency of association. Where secondary incidence is stated, the factors of age and duration of observation are usually not taken into account. For most precancerous lesions, the available information does not permit accurate estimation of the degree of increased risk of cancer which they carry.

There is adequate evidence that in women with chronic cystic mastitis[11] the subsequent incidence of breast cancer is from 2 to 10 times as great as the average. Epithelioma of the tongue occurs in syphilitic males about 5 times more frequently than would be expected normally, and recently there have been presented data[12] indicating that a similarily high incidence of cervix carcinoma occurs in women who have had syphilis. Other conditions apparently associated with subsequent cancer which may be mentioned are multiple polyposis, with intestinal cancer; cirrhosis of the liver with primary liver cancer; Paget's disease of bone with osteogenic sarcoma; atrophy of the buccal and esophageal mucous membranes, attributed to Vitamin B deficiency, with buccal and esophageal cancer.

Rhoads[13] has stressed the fact that many of the precancerous lesions are atrophic in nature. This is in accord with the observations that in experimental liver cancer produced by the carcinogenic chemical, butter yellow, atrophy of the liver cells precedes the development of cancer. Kensler and his associates[14] have shown further that in experimental animals this process can be prevented by supplying extra quantities of riboflavin and casein in the diet.

From the standpoint of cancer control, the existence of precancerous

lesions presents the possibility of instituting case finding procedures to discover individuals having such lesions, to be followed by treatment where possible, and by continued observation so that if cancer develops, it may be treated early in its course.

CONSTITUTIONAL FACTORS IN HUMAN CANCER

Although certain of the precancerous lesions (leukoplakia, farmer's skin) are attributable to environmental agents, others such as familial intestinal polyposis and multiple neurofibromatosis are apparently the result of hereditary or at least familial influences. Further, even in the effects of identified exogenous carcinogenic agents, the degree of inherent susceptibility or resistance probably plays a rôle, as is indicated by the many workers who, although exposed for long periods to carcinogenic chemicals, do not develop cancer. As in most other diseases, both the constitutional factor and the environmental must be considered in the etiology of malignant tumors.

The information available concerning presumably constitutional factors affecting cancer incidence in man comprises data on (1) hereditary forms of cancer or of benign tumors; (2) the occurrence of cancer families; (3) the familial incidence of cancer; and (4) the incidence of secondary primary cancers in patients following successful treatment of first cancer.

In a few rare tumors a hereditary mechanism is generally accepted, although the effect of unknown environmental factors cannot be excluded entirely. Retinoblastoma of the eye occurs with sufficient frequency in siblings and in descendants of cured patients to justify advice against marriage or having more children. Examples of hereditary benign tumors are familial intestinal polyposis which occurs in one-third the children of affected families and which becomes malignant in at least 25 per cent of cases; multiple neurofibromatosis which occurs in half the children if one parent is affected, and of which 13 per cent are reported to develop sarcoma; and certain benign bone tumors.

In addition, there have been described "cancer families," in which cancer, often of the same organ, such as the breast, uterus, or stomach, occurred in several brothers or sisters. What proportion of cancer patients come from such families is not known.

With regard to the common forms of cancer, studies have been made to determine whether the parents and siblings of cancer patients have any greater cancer mortality than the general population. The majority of such studies do show increased mortality in both parents and siblings, ranging from 20 to 60 per cent higher than expected. When cancer occurs in the same family, there is also a definite tendency for it to appear in the same organ.[15-20] It should be noted that such findings do not necessarily indicate a *general* familial concentration of cancer, but could be accounted for by assuming that a relatively small percentage of cancer patients come from cancer families. For example, in Crabtree's data,[15] among 1,029 families there occurred an excess of 93 cancer deaths (37 per cent) over that expected in parents and siblings together. An increase above normal of one case in 9 per cent of the families would thus account for all of the observed excess of cancer deaths, with a normal incidence in the remaining 91 per cent of families. It is probably superfluous to point out that an increased familial incidence of cancer does not necessarily indicate that hereditary or genetic factors are responsible, since similar environmental factors may also run in families.

The evidence regarding familial cancer, although far from conclusive, is

sufficiently impressive so that in some clinics a family history of cancer, particularly of the breast and uterus, is regarded as indicating need for increased watchfulness for the possible development of a similar tumor in other members of the family. Certainly no objection will be raised to such an interpretation, which can lead only to increased chance of early diagnosis with correspondingly increased probability of successful treatment.

Obviously, the time has not yet come to look upon the occurrence of cancer in one member of a family as the signal for examination and continued follow-up of the patient's brothers and sisters. In identified cancer families this procedure is justified. Without further information, its employment in families where only one case has occurred would be experimental. The principle is being applied by some physicians and clinics, but it has not reached the stage of public health practice.

Related to the problem of the nature of inherent susceptibility to cancer is the question whether the development of cancer in one organ denotes an increased susceptibility to cancer in other parts of the body. .This question has been approached by studying the subsequent incidence of other primary cancer in persons successfully treated for one malignant tumor. The subject has been investigated extensively by Peller,[21] and more recently by Lombard and Warren.[22] Their findings are similar and indicate that the incidence of second cancer is not significantly different from that of the general population. It should be emphasized that the opposite conclusion of Peller rests not on different findings but on the theoretical assumption that in cancer patients the subsequent expected incidence *should* be 5 times that of the general population. This is based on the further assumption that only 20 per cent of the population are susceptible to cancer and, consequently, that among cancer patients, who are susceptible, of course, the annual age-specific mortality rates should be 5 times that of the general population. There is no known method of determining susceptibility to cancer and no reason to assume that only those who develop cancer are susceptible. The available experimental evidence indicates that environmental factors can alter incidence markedly.

From the practical standpoint the significant fact is that the incidence of second cancer in cancer patients is not greatly different from that of the general population. This suggests that increased susceptibility to cancer, whatever its nature, is not general but more probably is organ specific, as is the case in certain high tumor strains of mice and rats.

The rôle of hereditary factors in the causation of human cancer and the extent to which such factors are modifiable by environmental agents, remains obscure. There seems little doubt that such factors do exist for some tumors and in some families, but the available evidence indicates that they are of only minor importance in the majority of cases.

DIFFERENTIAL MORTALITY FROM CANCER

The known facts regarding the etiology of cancer, fragmentary as they are, can be correlated with only a few of the differential characteristics of cancer mortality. These characteristics, however, have intrinsic interest from the standpoint of a control program.

Although great stress has been laid on the errors of diagnosis inherent in mortality statistics of cancer, many of the differences in cancer mortality observed in different population groups are not readily explainable by diagnostic error. The extent to which

diagnostic errors are responsible for differences in mortality in different population groups must be considered separately for each group and each site of cancer where such differences are found.

TREND OF CANCER MORTALITY

The continued upward trend of cancer mortality has made cancer one of the major health problems of our time. One-third of the increase in mortality is due to increased "aging" of the population. The remaining increase is sometimes written off as reflecting increased recognition of cancer rather than increased incidence.

In upstate New York, comparison of age-standardized mortality from 1931 to 1941 shows an increase during this period of 10 per cent in male mortality; and a decrease of 6 per cent in female mortality. Mortality from cancer of the buccal cavity, skin, and lip, has decreased slightly in both sexes. Death rates from cancer of the stomach and the liver have decreased significantly in both sexes. Cancer of the breast increased only slightly; mortality from uterine cancer decreased by approximately 16 per cent. The increase in mortality from certain types of cancer in males is sufficient to raise the total mortality above that in the earlier period. The most marked increase occurred in cancer of the lungs and other respiratory organs, mortality from which increased threefold in males but only slightly in females. In females the decline in certain sites, notably the stomach, the liver, and the uterus, more than offsets the increased rate for other types of cancer. Since there is no reason to believe that diagnostic accuracy lessened during the past decade, it is probable that this decrease foreshadows a continued downward trend in cancer mortality among women.

From data regarding hospitalization of cancer cases and proportion of diagnoses verified by pathological examination, there is no reason to believe that, for the same site of cancer, diagnostic accuracy is different in the two sexes. For this reason, as Gover has pointed out, the more rapid increase in mortality for certain internal types of cancer in males than in females is probably real and not due entirely to improved diagnosis.

CANCER MORTALITY BY COLOR AND GEOGRAPHIC REGIONS IN THE UNITED STATES

The possible association of cancer of the buccal cavity and of the liver with certain dietary deficiencies and the association of tongue cancer and probably cervix cancer with preëxisting syphilis suggest that mortality statistics in this country might reflect corresponding differences for cancer of these sites between geographic sections and between white and colored. For example, we might expect a relatively high mortality from buccal and liver cancer in those southern states with widespread gross dietary deficiency as indicated by high mortality from pellagra; also, colored males would be expected to have a higher mortality from tongue cancer; and colored females from cancer of the cervix.

Govers data [24] for the years 1930 to 1932 show that age-standardized mortality from total cancer in both sexes in this country is highest in the Northeast and on the Pacific coast, lowest in the South and Southwest. The only exceptions are cancer of the skin, which is highest in the South, and cancer of the mouth and pharynx, which is highest in southern females and second highest in southern males. All other forms of cancer, including cancer of the liver and biliary passages, show lower rates in the South. These relative differences in site distribution of cancer between North and South appear in hospital deaths as well as in all

recorded deaths. The differences, however, are not so marked in morbidity data. The expected difference in cancer mortality in the South is thus present for buccal cavity cancer but not for cancer of the liver.

Comparison between white and colored cancer mortality in the United States shows that for most forms of cancer, colored mortality is lower than among whites. The differences are less marked in the North than in the South, presumably due to the fact that Negroes in the North obtain better medical care. A peculiar feature of cancer mortality in Negroes is that it is lower only in the age groups above 54 years; in younger age groups it is as high or slightly higher than among whites. Mortality from tongue cancer is lower in colored females, and only slightly higher in colored males than in whites.

The forms of cancer showing markedly higher mortality in the colored race are cancer of the external genitalia in males, and of the uterus and other female genital organs in females. The excess mortality from cancer of the uterus among colored women is 75 per cent in the South and 91 per cent in the North, and is sufficient to bring total cancer mortality among colored females slightly above that among whites in both sections of the country. In the experience of the Metropolitan Life Insurance Company's industrial department [25] from 1917 to 1935, the age-standardized mortality from uterine cancer among colored females was 55 per cent higher than among whites. We do not as yet have mortality data for cancer of the cervix uteri separated from that of the uterine fundus, but it is known that approximately 85 per cent of uterine cancers arise in the cervix.

The expected differences in cancer mortality between white and colored races because of the apparent association of tongue and cervix cancer with syphilis are not found for tongue cancer, but are for uterine cancer. Obviously, such a finding is merely corroboratory and does not establish the fact of an association between syphilis and uterine cancer.

Regardless of its cause, the markedly high mortality from uterine cancer among colored females deserves greater attention than it has received, both from the standpoint of investigation and from that of administration of cancer control programs.

Cancer of the uterus and of the breast and ovary occur also with different frequency among women of different marital status. Uterine cancer mortality is highest among married women, while breast and ovarian cancer mortality is higher among single women. The mortality from breast cancer among childless married women is as high as in single women. The higher mortality from breast cancer among single women and childless married women is usually attributed to the absence of normal lactation, while the higher mortality from uterine cancer in married women has been interpreted as evidence that injuries resulting from childbirth are causes of uterine cancer. These interpretations have not been fully established. Recent data from Australia, described by Dorn,[26] indicate that uterine cancer mortality is highest among married women who have never borne children.

A more complete review of the differential mortality of cancer is not within the scope of this paper. It may be said, however, that most of the major forms of cancer exhibit sufficiently different epidemiological characteristics to indicate that each must be approached as a separate problem in cancer control.

SUMMARY AND DISCUSSION

In summary, there is evidence that the occurrence of human cancer is in

some cases attributable to the influence of specific chemical and physical agents; in others to an association with precancerous lesions and with other diseases; and, in a relatively small number of cases, familial factors, which may be hereditary, are operative. In a large proportion of cases, none of these etiologic factors can be identified. Considerable differences appear in mortality from various forms of cancer in persons of different race, economic status, and marital status. Most of these differences are not readily explainable by any single hypothesis regarding the causation of cancer.

Many of the etiological and differential factors discussed point to possible public health applications in the form of special attention in education, in case finding and in follow-up directed to the groups which have an apparently high mortality and incidence of certain forms of cancer. Examples of such groups are: industrial and unskilled workers (cancer of the skin, lip, mouth, larynx, and stomach); unmarried women (cancer of the breast); syphilis patients (cancer of the vulva, cervix, tongue); Negro women (cancer of the uterus). The experience of the Strang Cancer Prevention Clinic in New York City, in case finding among apparently healthy women, indicates that the proportion of early cancer cases found is comparable to that of early cases of tuberculosis discovered by mass x-ray examinations.[27] Active case finding applied to groups with higher than normal incidence of cancer may be correspondingly more effective.

It seems reasonable to forecast that, in the future, cancer control programs will be guided to a greater extent than in the past by existing knowledge and by further investigation of the epidemiological characteristics of the disease. These point to a logical development of control activities directed toward population groups which apparently stand in greatest need of such measures and among which they should prove most fruitful.

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U. S. Cadet Nurse Corps Induction Pledge

At this moment of my induction into the United States Cadet Nurse Corps of the United States Public Health Service:

I am solemnly aware of the obligations I assume toward my country and toward my chosen profession.

I will follow faithfully the teachings of my instructors and the guidance of the physicians with whom I work;

I will hold in trust the finest traditions of nursing and the spirit of the corps;

I will keep my body strong, my mind alert, and my heart steadfast;

I will be kind, tolerant and understanding;

Above all, I will dedicate myself now and forever to the triumph of life over death.

As a Cadet Nurse, I pledge to my country my service in essential nursing for the duration of the war.

Serological Identification of Dysentery Bacilli*

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THE diagnosis and control of bacillary dysentery is becoming an increasingly important public health problem, especially during the war period.[15] The laboratory is concerned with the problem of diagnosis, and must provide a rapid, accurate, and detailed examination with a report to the control official as quickly as is compatible with accuracy. Because of the nature of the infection, laboratory diagnosis has depended almost entirely on the isolation and identification of the causative organism from fecal specimens. Cultures are seldom isolated from blood and urine; agglutination reactions with patient's serum have been of little use; and bacteriophage tests have value only under special circumstances.[16]

Organisms of the *Shigella* genus constitute a heterogeneous collection both as to physiological properties and antigenic structure. Although several species have recognized pathogenic action, only two types, *Shigella paradysenteriae* (Flexner) and *S. sonnei* are commonly encountered in bacillary dysentery in the United States.[15] *S. dysenteriae* (Shiga) and *S. ambigua* (Schmitz) are relatively rare, while *S. alkalescens* and *S. dispar* are generally considered of doubtful pathogenicity. Considerable evidence has accumulated, however, to show that under certain conditions *S. alkalescens* has distinct pathogenic action,[10, 13] and for the purposes of this discussion it will be considered with the pathogenic types. The Newcastle organism, although it differs somewhat in biochemical properties, will be grouped with the Flexner types.

Identification of the dysentery organisms depends on morphological, cultural, physiological, and serological characteristics. Biochemical reactions are valuable for a tentative identification and especially for separation of the *dysenteriae-ambigua* section from the mannitol fermenting types. Other biochemical properties (fermentation of lactose, sucrose, maltose, rhamnose, arabinose, dulcitol, xylose, sorbitol, and production of indole) are useful for differentiating *S. paradysenteriae, S. sonnei,* and *S. alkalescens* species. Occasionally epidemic strains can be identified by a physiological peculiarity. For type differentation within the paradysentery group, however, fermentation reactions are of little value. In other instances, such as lactose fermentation by *S. sonnei,* many days are required to complete the reactions. Serological methods offer the advantages of accuracy and speed and permit a more complete description than can be obtained from biochemical study. The slide agglutti-

* Presented before the Laboratory Section of the American Public Health Association at the Seventy-second Annual Meeting, New York, N. Y., October 13, 1943.

nation test with specific sera is a simple, rapid, and inexpensive method of serological identification. Within the Flexner group, especially, the advantages of this method are apparent when applied to strain typing.

The basis for the serological differentiation of paradysentery types is the work of Boyd [5, 6] who described six different sero-types each possessing a specific antigen but related by one or more common group antigens. These included the V, W, and Z strains of Andrewes and Inman,[1] the Newcastle or type 88 strain as well as two other types, 103 and P119. Six additional less frequently encountered paradysentery types (170, P288, P274, D1, D19, P143) also were described which possessed no group antigen or only minor antigens of the Flexner organisms. Our examination of the *S. paradysenteriae* strains has confirmed the presence of specific antigens and has identified nine components of the group antigen distributed among the various Flexner types.[17] An additional W serotype was defined by marked differences from the standard strain in group antigen, and epidemiological studies of this variety have shown it to be a valid type. The X and Y strains had no significant type-specific antigens and probably should not be considered as separate types but as variants of other types.

The nomenclature for the Flexner group proposed by Boyd [6] provides a simplification and clarification of terminology and a practical basis for identification. This terminology will be used in the following discussion. The V, W, Z, 103, P119, and 88 (Newcastle) types have been designated by Roman numbers I through VI. It seemed advisable [17] to divide the II or W group into two sections II_a and II_b on the basis of differences in group antigen. Departures have been made from Boyd's scheme in assigning arabic numbers to the components of the group antigen. Four of these components have been used in the strain typing methods although all are not essential for identification of the serological types. These fractions are designated by numbers as follows: 4 present in I, II_a, Y, and VI types; 5 in I and V types; 6 in I, III, and some IV types; 7 in II_b, III, V, and the old type X strains.

The other Boyd cultures gave some cross-reactions with the Flexner types,

TABLE 1

Differentiation of Types of Shigella paradysenteriae (Flexner group) by the Slide Agglutination Test

Antigenic Factor →		*Type-specific*						*Group Specific*				
		I	*II*	*III*	*IV*	*V*	*VI*	*4*	*5(V)*	*6(I)*	*6(III)*	*7(8)*
Serum →	*Group A (pooled)*	I	*IIa*	*III*	*IV*	*V*	*VI*	*IIa*	*V*	*I*	*III*	*IIb*
Adsorbed with		*III, IV*	*I*	*I, IIb*	*I*	*I, IIb*	*I*			*IIa, V*		*I*
Culture →		*V, VI*	*V*	*IV*	*III*	*IV*	*IIa*	*IIb*	*IIb*	*VI*	*IIb*	*IIa*
Tested with culture												
Type I —(V)	+	+	0	0	0	0	0	+	+	+	+	0
IIa—(W)	+	0	+	0	0	0	0	+	0	0	0	0
IIb—	+	0	+	0	0	0	0	0	0	0	0	+
X	+	0	0	0	0	0	0	0	0	0	0	+
Y	+	0	0	0	0	0	0	+	0	0	0	0
III —(Z)	+	0	0	+	0	0	0	0	0	+	+	+
IV —(103)	+	0	0	0	+	0	0	0	0	+*	+*	0
V —(P119)	+	0	0	0	0	+	0	0	+	0	0	+
VI —(88—Newcastle)	+	0	0	0	0	0	+	+	0	0	0	0

* Strains of Type IV isolated in the United States did not have the 6 fraction but usually agglutinated in the 3 and 4 group sera

particularly type I. Type P274 had an antigen present in *S. alkalescens* and in some paracolon and coliform bacteria,[13] and the D19 strain shared a fraction in common with *S. sonnei*. Adsorption of these antibodies from the typing sera has simplified the interpretation of the slide test reactions.

The recognized human pathogens of the *Shigella* group are included in the typing scheme devised for diagnostic use. Included in the scheme are two specific sera for the mannitol negative members, *S. dysenteriae* and *S. ambigua*, and for the mannitol fermenting organisms, two pooled typing sera covering the two sections of the *S. paradysenteriae* group and antisera for *S. sonnei* and *S. alkalescens*. By the use of these six sera a tentative serological typing can be made even though fermentation reactions are not completed. If the culture belongs to either section of the paradysentery group, the antigenic type can be determined by testing for the type specific and group antigens with adsorbed typing fluids as shown in Tables 1 and 2.

Cultures used to prepare antisera were tested for smoothness before injection and stock strains have given satisfactory results. Although Glynn and Starkey [7] described two antigenic types of *S. sonnei*, the species is generally considered antigenically homogeneous.[15] In our hands Glynn and Starkey Types I and II cultures appeared to be identical as shown by reciprocal adsorptions. However, we have encountered two antigenically different variants of *S. sonnei*. The variation does not appear to be a "rough" change and for preparing typing sera a strain with broad antigenicity was selected. Antigenic analysis of the several Flexner strains has shown that the same group antibody usually can be obtained in satisfactory titer in antisera from two or three different types. The 6 group agglutinin common to Types I, III, and IV, for instance, could be prepared from each of the three antisera; and I and III sera are shown in Table 1. On the other hand, satisfactory titers for the 7 fraction of II_b, III, V, and the Andrewes and Inman Type X cultures have not been obtained in Type III antisera. Adsorbed typing fluids prepared from sera shown in the tables have proved satisfactory. Use of antisera made from X or Y strains and the use of these strains for adsorption offers some advantages since type-specific reactions are not involved. However, these antisera are not needed and the results presented are based entirely on the Flexner Types I–VI.

TABLE 2

Identification of S. paradysenteriae (Boyd types), S. sonnei and *S. alkalescens by the Slide Agglutination Test*

Serum →	*Group B (pooled)*	*170*	*P288*	*P274*	*D1*	*D19*	*P143*	*Sonnei*	*Alkalescens*
Adsorbed with →	*I, Sonnei, Alkalescens*	*I*	*I*	*Alkalescens*	*0*	*Sonnei*	*I*	*0*	*0*
Tested with culture									
S. paradysenteriae									
Type 170	+	+	0	0	0	0	0	0	0
P288	+	0	+	0	0	0	0	0	0
P274	+	0	0	+	0	0	0	0	±
D1	+	0	0	0	+	0	0	0	0
D19	+	0	0	0	0	+	0	+	0
P143	+	0	0	0	0	0	+	0	0
S. sonnei	0	0	0	0	0	0	0	+	0
S. alkalescens	0	0	0	0	0	0	0	0	+

METHODS

Antisera were prepared by injecting rabbits with formalinized (0.3 per cent) broth cultures at 5–7 day intervals in increasing doses until satisfactory agglutinin titers were reached (3–5 injections). *S. dysenteriae* were washed before injection. When titers of 1:5,120 or higher were reached or when no further increase occurred after additional injections the animals were bled and the serum preserved with 0.5 per cent phenol or by desiccation by the lyophile process.

Antigens for the slide test were made by suspending the growth from 18–24 hour agar slants in formalinized saline (0.3 per cent) and adjusting the density approximately to Gates 1.0. With most cultures of *S. alkalescens* it was necessary to heat the antigen at 60–70° C. for 1 hour before agglutination would occur. Since this degree of heating did not affect reactions of the other *Shigella* strains studied it was done as a routine procedure with all types.

The slide tests were performed on 5–7 in. glass slides divided by paraffin markings into sections approximately 1 x 2.5 cm. A total of 72 tests could be made on one slide. Paraffin rings as made for the syphilis slide tests (Mazzini, Kline) are also satisfactory. Equal quantities (about 0.02 ml.) of serum and antigen are added to the square, mixed, agitated mechanically or by hand with a rotary-rocking motion for 2 minutes, and then the degree of agglutination is read.

Standardization of the antisera must be done before they can be used for typing. *S. dysenteriae, S. ambigua, S. sonnei, S. alkalescens,* and the pooled sera were used without adsorption but in dilution sufficient to eliminate the minor cross-reactions as shown by tests with representative organisms of all the types. In each of the pooled paradysentery sera six types were included. The typing fluids were made by combining the individual sera and diluting according to titer. Final dilutions in the mixture varied from 1:10 to 1:100.

Type- and group-specific typing fluids were prepared by adsorption with appropriate cultures as indicated in Tables 1 and 2. Sera were adsorbed at 37° C. in 1:5 or 1:10 dilution with formalinized culture until the reactions of the adsorbed sera were specific. The completed typing fluids were preserved with 0.5 per cent phenol.

Methods employed in the Bureau of Laboratories for the isolation of enteric pathogens have been outlined previously.[2] SS agar and MacConkey's agar are used for isolation of *S. paradysenteriae* and *S. sonnei* strains. The classification of the organisms as determined by the agglutination test should be confirmed by fermentation reactions.

RESULTS

A summary of the cultures examined is presented in Table 3. Included in the total figures are stock collection strains received from a number of sources as well as recently isolated cultures of most of the types. The strains isolated in Connecticut and studied at the Bureau of Laboratories of the Connecticut State Department of Health since 1940 are listed separately to show the incidence of the various types in this locality.

Seventeen strains of *S. dysenteriae* have been identified by the slide test although none were isolated in Connecticut. Five cultures of *S. ambigua* were typed including one from a Connecticut case. The majority of strains were in the Flexner group, distributed among the I, II_a, II_b, III, IV, V, and VI varieties as indicated in the table. The frequency of Type III strains is high because of the large numbers isolated from one state institution where this type infection is endemic with occasional active outbreaks. If cultures

from this hospital are excluded the incidence of Type III cases was 27, or about the same as that for Types I, II_a, and II_b. One Type IV case was recently encountered within the state, and this type is present elsewhere in the United States since 8 strains received from Texas and 12 from Mississippi were identified as Type IV. One instance of Type V infection was recognized in Connecticut and one outbreak of Type VI (Newcastle) infection occurred from which ten isolations were made. Representatives of only two of the remaining Boyd types have been studied which were isolated in the United States. We identified ten strains of Type 170 and two of Type P274 isolated in Mississippi.

The incidence of *S. sonnei* types is high and 264 strains were identified of which about 90 per cent were isolated within the state. The figures for *S. alkalescens* does not represent the incidence of this species over the same time period since many strains that were isolated were not identified serologically.

A number of cultures which were tentatively classified as dysentery organisms on the basis of biochemical reactions could not be typed by the diagnostic sera. Some of these have been subsequently classified in the paracolon group, but a number remain, which by physiological tests resemble the pathogenic *Shigella types.* The Eijkman and trimethylamine reactions of some of these strains have been determined and are negative, similar to *S. dysenteriae* and *S. paradysenteriae* cultures.[12, 18] Some of these were mannitol-negative and may be like strains recently described by Sachs[11] isolated from cases of bacillary dysentery in India and Egypt. Other untyped strains were typical *S. paradysenteriae* as defined by *Bergey's Manual,* while some differed only by fermentation of xylose or dulcitol. Cultures identified by fermentation reactions as *S. ceylonensis* or *S. dispar* have not been included in Table 3.

DISCUSSION

The results show that satisfactory serological identification of the pathogenic *Shigella* organisms can be made

TABLE 3

Cultures of Shigella Classified Serologically by the Slide Agglutination Test

Shigella Type	*Old Designation*	*Number of Strains Examined*	*Number of Strains Isolated in Connecticut, 1940–1943*	*Number of Individuals with Positive Cultures in Connecticut, 1940–1943*
Dysenteriae	*Shiga*	*17*	*0*	*0*
Ambigua	*Schmitz*	*5*	*1*	*1*
Paradysenteriae I	Andrewes and Inman V	45	26	23
IIa	" " " W	68	45	37
IIb		27	23	21
	" " " X	16	0	0
	" " " Y	8	0	0
III	" " " Z	371	357	122
IV	Boyd Type 103	25	1	1
V	" " P119	6	1	1
VI	" " 88 (Newcastle)	18	10	10
	" " 170	13	0	0
	" " P274	5	0	0
	" " P288	3	0	0
	" " D1	2	0	0
	" " D19	2	0	0
	" " P143	2	0	0
Sonnei		264	237	198
Alkalescens		86	68	66
Atypical forms		22	..	..

by the slide test. The test is not as complex as might be assumed. The procedure outlined uses 16 or 17 immune sera for the entire group, but a great majority of the isolations could be identified with only 8 or 9 antisera. With the simple method of immunization the necessary antisera can be produced with little trouble. Titrations can be done in a short time, and the adsorption procedures for the preparation of type-specific and group sera are simple provided cultures of the proper antigenic structure are available. Antigens for the slide test are easily and quickly made and 1 ml. of typing fluid should be sufficient for nearly 50 tests. In our own laboratory we feel that the test is an excellent diagnostic aid. Furthermore, this method is similar to that used for *Salmonella* typing and can be incorporated into the routine procedure with little difficulty.

Strain identification in the detail that has been carried out may seem unnecessary and impractical at first thought. The majority of public health laboratories go only so far as to classify into the Flexner group, primarily because typing sera are not available. However, strain typing is essential if satisfactory epidemiology is to be done and detailed serological study is the only reliable means of typing. Occasionally a particular strain can be identified by its fermentative reactions; however, we have had strains of Type I, II_a, II_b, III, IV, and V which gave identical reactions in the usual differential media. Typing has been applied in the study of several small outbreaks of *S. paradysenteriae* infection. For instance, during an outbreak of Type III infection in a state hospital three strains of Type II were found. Two were II_b and one was II_a. Follow-up of these cases showed that the two II_b types were new transfers to the building where the Type III outbreak occurred. One was a recent admission to the hospital and the second had been associated with her for a short time in another section of the hospital. The Type II_a was isolated from an attendant. All three were unrelated to the active outbreak of Type III infection. Other instances similar to this have been encountered.

Boyd's scheme of labeling the paradysentery strains has a number of advantages, and provides a good working basis for classification. The differentiation is based on the presence of the specific antigen, and X and Y strains are not considered as separate types. The common relationship through the group antigen is shown for the Flexner Types I through VI. If marked and consistent differences in group antigen among strains having the same type antigen are found, the strains can be identified by a subgrouping of the type as we have done for the W or II group. Inclusion of the Type 88 or Newcastle organism with the Flexner group appears justified on the basis of serological structure. It seems logical that greater weight should be placed on antigenic structure than on physiological properties. Varieties which differ in gas production or fermentation of mannitol or dulcitol as do the Manchester, Newcastle, and Type 88 strains [6] can properly be considered as one type and included with the other Flexner organisms.

The essential differences between the types are the specific antigens, and therefore methods for typing should be concerned first of all with the detection of these type-specific antigens and secondarily with identification of the major group components. Methods utilizing unadsorbed sera and based on group reactions, such as that published recently by Hardy and associates,[8] overlook this fundamental difference between types. The use of adsorbed sera is imperative if satisfactory dis-

tinction is to be made between the type-specific and the group reactions. Furthermore, the various group components that are of differential value cannot be identified readily except by previous adsorptions of the antisera.

The possibility of loss of the type-specific antigen by variation to the group phase as described by Boyd has caused no difficulty in typing newly isolated Flexner cultures. On the other hand, it has been our experience that all of the newly isolated strains have contained some group antigen and the several group components could be identified in them. We have found variation in group components, however, particularly among the 103 strains. The 21 strains isolated in this country all have differed from the type culture since they did not have the principal 6 component of the type strain but agglutinated with the 3 and usually the 4 group antisera. This difference probably is a result of variation of the type strain.

Among the Flexner types we have found some biochemical differences which have correlated to a considerable degree with serological structure. Some of these seem worth mention. Type VI (Newcastle) and about 50 per cent of the II_a strains were the only indole-negative cultures encountered. Approximately two-thirds of the I and II_b strains, grown in 1 per cent tryptone broth, gave weak or trace reactions at 24 hours with Kovac's reagent and were negative with the Gnezda test. After 5–7 days' incubation, however, all gave distinct reactions by both tests. In contrast to all other types only 4 per cent of Type III strains fermented arabinose. The great majority of III cultures (97 per cent) fermented sorbitol, however, in contrast to the I, II, and IV strains which were uniformly negative. Reactions in sucrose, maltose, and rhamnose have been of no differential value.

On the basis of Boyd's findings we have included his additional types with the *S. paradysenteriae* group. They show little serological relationship to the Flexner types and some of them are slow fermenters of dulcitol or xylose. According to *Bergey's Manual* the xylose fermenting strains would be excluded from *S. paradysenteriae* species. However, they are similar in other characteristics and, considering their probable rôle in dysentery infection, should be included with the pathogenic paradysentery organisms. Furthermore, these strains resemble the other *S. paradysenteriae* in their Eijkman reaction and in their failure to reduce trimethylamine oxide.[12, 18] As yet little information is available on the presence of these types in this country. A low incidence is expected since Types P288, D19 and P143 comprised a total of only 1.2 per cent of the 7,339 strains studied by Boyd.[6] However, Type P274 has been reported in a food handler outbreak[9] and we have identified strains of P274 and 170 types. Possibly the position of the Boyd strains should be left undefined for the present, but it seems probable that the scheme of labeling the Flexner types should be extended eventually to include the type-specific antigens of the additional Boyd strains.

It is impossible that any practical classification of the *Shigella* group will include all types since new ones will be encountered from time to time. In Table 3 a number of strains are listed which could not be classified by the present scheme. Some of these were old stock strains in which variation had doubtless occurred; possibly some of the others will subsequently turn out to be additional pathogenic types. It may be pertinent in this connection to suggest that a service for laboratory study of *Shigella* cultures somewhat like that rendered by Dr. P. R. Edwards at the National Sal-

monella Center for the *Salmonella* group, for instance, would meet a need that is felt often by public health laboratory workers.

Not infrequently, coliform and paracolon cultures have shown antigens in common with members of the *Shigella* group. Usually the reactions were minor and occurred with unadsorbed sera. We have also obtained agglutination of many of the paradysentery strains with certain *Salmonella* sera. These reactions have not been thoroughly investigated but the reciprocal reactions of *Salmonella* cultures in *S. paradysenteriae* antisera have usually been negative, and they could not be attributed to the type or group components that have been identified in the paradysentery organisms. Antigens similar to the *Salmonella* VI and XIII components have already been noted.[4] A broad distribution of the antigens of *S. alkalescens* in coliform and paracolon types [13] and in the P274 strain also occurs. Numerous and broad antigenic relationships have also been described for *Salmonella* organisms and other nonpathogenic types.[3, 14] A similar overlapping of physiological characteristics has been pointed out between the various groups of the enteric organisms. The fact that organisms of the *Enterobacteriaceae* appear to be a continuous series of types without sharp demarcation either as to physiological or antigenic properties between the various sections, constitutes a problem to the " practical diagnostic bacteriologist." At present his best approach seems to be to use all available criteria for differentiation. Typical forms should offer little difficulty. It is up to him to recognize the atypical forms but the study of these can best be handled by the research laboratory.

SUMMARY

A method for serological identification of the pathogenic dysentery bacteria has been presented which utilizes a slide agglutination test employing formalinized antigens and titrated and adsorbed typing fluids. The test has the advantages of accuracy and speed, is similar to *Salmonella* typing methods, and can be readily incorporated into routine procedures.

Shigella organisms which have been identified by the slide test are *S. dysenteriae* (Shiga), *S. ambigua* (Schmitz), *S. paradysenteriae* (Flexner, Newcastle and Boyd types), *S. sonnei,* and *S. alkalescens.*

Within the paradysentery group, type identification is accomplished by the use of suitably adsorbed sera to show the type-specific antigens and certain group antigens of differential value. Type identification which can be done only by serological methods is essential for satisfactory epidemiological study.

The classification of the Flexner group proposed by Boyd in which V, W, and Z strains, Boyd Types 103 and P119, and the Newcastle organism have been designated as Types I through VI respectively on the basis of type-specific antigens provides a practical working basis for identification of the six types. It seems advisable to divide the II or W group into two sections since cultures have been encountered which had the same type-specific antigen but which were distinct epidemiologically and which exhibited marked differences in group components.

The Boyd Types 170, P288, P274, D1, D19, and P143 can be identified by their type-specific antigens. Some cultures have been encountered resembling pathogenic dysentery organisms which could not be classified into the recognized types by serological methods.

Results of the serological typings of 1,005 *Shigella* strains were presented. Strains isolated in Connecticut during a 3 year period included *S. ambigua, S. paradysenteriae* Types I, II_a, II_b, III, IV, V, and VI, *S. sonnei,* and *S.*

alkalescens. Strains of *S. paradysenteriae*, Boyd Types 170 and P274 were identified among cultures isolated in other parts of the United States.

ACKNOWLEDGMENT—We are indebted to Elizabeth Murphy and to E. K. Borman for assistance and suggestions during this work.

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Nutrition: A Factor Important for Industrial Hygiene*

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THE great developments in the science of nutrition over the past three decades have finally led to an appreciation of the importance of nutrition as a factor in industrial hygiene. We now accept the concept that health and efficiency can be affected by the *lack* of something from the food as well as the *presence* of a positive agent such as, for example, a machine that can injure a worker unless he is properly protected, air with too much dust in it, a noxious gas or food poison, a dangerous chemical that can cause injury when coming in contact with the skin, or a harmful microörganism.

At the beginning of this century it was generally believed that any combination of foods that furnished sufficient energy, protein, and important minerals like calcium and iron sufficed to nourish the body properly. If the student of nutrition should be asked in 1943 to list individually all the specific dietary factors known to be essential for health and well-being, he would cite approximately forty separate items. These could be classified under four headings:

1. Energy
2. Protein
3. Inorganic or mineral nutrients
4. Vitamins

This summary of the many food factors needed for health, admittedly very brief and perhaps open to criticism as constituting an oversimplification of an exceedingly complicated situation, is nevertheless to be emphasized here, because many industrialists, nutritionists, and students of public health and industrial hygiene have concentrated their attention too much on certain of these categories of interest, vitamins for example, and ignored the many others that are also important. These new developments have contributed to establishing the concept that health and efficiency can be affected by the *lack of something* in contrast to the *presence* of something—a negative rather than positive agent affecting health.

CURRENT INTEREST IN NUTRITION

The war and the need for tremendous industrial activity have compelled us to give more attention to this factor of diet in relation to industrial health. England, which has been much closer to the active theater of war, faced this problem long ago, and in 1939, through its government agencies, ruled that every industrial plant employing 250 or more workers should furnish at least one good meal per employee per day. Involved in this particular situation was, of course, the fact that a very large part of the food for the British Isles had to be received by shipment from

* Presented at a Joint Session of the Industrial Hygiene, Food and Nutrition, and Public Health Nursing Sections of the American Public Health Association at the Seventy-second Annual Meeting in New York, N. Y., October 13, 1943.

over the seas; it was necessary that this available food be properly rationed, and that the workers in industry be well fed in order to be able to turn out the instruments of war.

The Canadian Council on Nutrition [1] has adopted a set of recommendations concerning nutrition in industry that should be examined by all who would study this topic. Our own National Food Conference, held in May, 1941, recognized the importance of this problem and devoted a section to discussion of it. The National Research Council established a committee to study and advise concerning this question, and this committee has published a report [2] which merits the careful examination of all students of the subject. Two of the Councils of the American Medical Association have sponsored discussion of this topic at important national meetings.[3] The American Association of Industrial Physicians and Surgeons has had a Committee on Nutrition in Industry, and this committee has been able to secure valuable information concerning prevailing industrial feeding practices. More recently there has appeared a very interesting and comprehensive document entitled *The Nutrition Front,* which is the report of the New York State Joint Legislative Committee on Nutrition.[4] Finally, there should be mentioned the fact that the Nutrition and Food Conservation Branch of our federal Food Distribution Administration has an office in Washington that devotes itself to national aspects of this problem, and serves as a valuable source of information and guidance to all persons interested in this field of endeavor.

From what has just been cited it is evident that there has been a growing appreciation of the importance of insuring the health of the industrial worker as that health may be affected by food. As further evidence in support of this view one may cite the following passage from *Special Bulletin No. 12,* issued by the U. S. Department of Labor in 1943 [5]:

> With plant after plant ranking dietary troubles high on their illness and absentee lists and with findings by the National Research Council that 71 per cent of workers' families have "poor" or "only fair" diets, the close relationship between nutrition and productivity needs no argument.

WHAT DO WE NEED TO KNOW?

In attempting to apply our modern knowledge of nutrition to industrial hygiene it is important that a body of pertinent scientific data be obtained. How are our industrial workers being fed at the present time? Can these feeding practices be improved? To what extent does malnutrition of one kind or another occur among industrial employees? If the incidence of such malnutrition is practically nil, one is certainly justified in questioning the wisdom of any elaborate program involving special measures of one kind or another which industry, or government, or both will have to implement by the establishment of special bureaus and for which large sums will have to be expended; if such malnutrition does exist, remedial measures of some kind are definitely in order. Are there any special industrial hazards for which one or more specific dietary factors, vitamins for example, are of demonstrated value? These are some of the questions that arise in any thoughtful consideration of the application of this modern knowledge of nutrition to industrial hygiene.

HOW ARE WORKERS BEING FED?

How are our industrial workers now being fed? It is a matter of common knowledge that the food situation is not the same in all parts of the country. The Stiebeling-Phipard [6] study of 4,000 family dietaries collected in different sections of the country may be cited as suitable evidence for this statement. According to that study, pub-

lished in January, 1939, and therefore based on data collected prior to that date, the southern California area proved to be one of the best on account of its liberal supply of milk and milk products, citrus fruits, fresh colored vegetables, and meats.

Students of industrial hygiene might therefore suppose that because an industrial plant is located in a well fed area, the industrial workers in that plant will therefore be well fed. Unfortunately, this assumption has been proved to be erroneous, at least with respect to aircraft workers in one large plant in southern California [7, 8] since 1939, the date the Stiebeling-Phipard study was published.

Time will not permit a detailed discussion of the findings at this plant. The dietary patterns described by Miss Wiehl [7] no doubt reflected a situation resulting from the operation of many factors, such as a tremendous and sudden expansion of the plan on account of the war, a great influx of workers, a lack of concomitant development of suitable housing and eating facilities, and of course shortages of various foods in the area. Mere mention of these various factors, however, indicates how complicated many of the food situations in industry now are, and how many causes have operated to bring them about.

The point to be emphasized here is that students of industrial hygiene should first of all seek the facts regarding any feeding situation in question; when those facts have been collected, appropriate remedial measures can then, of course, be considered. The National Research Council's Committee on Nutrition in Industry has done all it can to foster this point of view, and has actively supported the research carried out in the aircraft plant in California under Dr. Borsook's direction with this end in mind: let us first of all *get the facts*. It is obvious that the prosecution of similar studies in other sections of the country is desirable, and efforts to organize such additional studies have been made; unfortunately such efforts have not been attended with much success for various reasons.

EATING FACILITIES IN PLANTS

Many industrial plants operate dining rooms, cafeterias, or other eating facilities. Examination of this situation reveals two separate problems. One concerns the operation of the facility, selection of the food to be served, supervision of its preparation and the like. Some of these facilities are well operated, being under the supervision of people trained in the science of nutrition and the application of that science in the handling of food; but even here it happens that a certain body of scientific facts is needed, pertaining particularly to the effect of various kitchen procedures on the nutritive values of the foods handled. Something is known about this topic but much desirable information remains as yet to be secured. It is known, for example, that much of the vitamin C is lost from the cabbage leaf when it is chopped up into fine pieces in making cole slaw, this loss being due to greater exposure of the cabbage cells to air. In the cooking of many foods appreciable amounts of vitamin B_1—thiamine—and other vitamins are lost; when the cooked product is allowed to stand for an appreciable period on the hot table from which it is served, further losses occur. This whole subject needs more extensive investigation; fortunately this needed additional work is already being carried on in various places, in large measure as part of coöperative research involving agricultural experiment stations and many other groups.

The problem just mentioned concerns the management of the eating facilities in plants. Although many such facilities are well operated, investigation has

revealed that many others are not; too often these others have been found to be supervised by persons with no special training in the science of nutrition, whose chief qualification has been that at some time or other they were able to serve a large number of meals at low cost. Students of industrial hygiene should be able to do something here in educating industrial managers to see the importance of securing qualified supervision of their plant operated eating facilities.

THE PROBLEM OF SELECTION OF FOOD

Even if these plant restaurants and the like are supervised by competent persons, we still have before us the problem of the worker himself, and how he selects food. The solution to this problem, in the last analysis, involves education of the employee in matters of food and nutrition. The management of the restaurant can assist in devious ways. For example, a combination of foods which makes an excellent lunch from the nutritive standpoint can be offered at a slightly lower cost than various popular but less valuable items would be if purchased singly. By this hidden device, so to speak, many workers can be encouraged to improve their selections by a subtle appeal to the pocketbook. The so-called "victory lunch" plan now used in many plants is based essentially on this idea.

Some facts have been collected in certain plants concerning the choices of foods made by employees passing down the cafeteria line. Trained nutritionists, able to rate the various selections, have reported interesting data. Food selections of course reflect food habits, family and racial backgrounds, and many other factors; and food habits are not easily changed. One authority once estimated that it took about thirty years of effort to change the food habits of the average Filipino sufficiently to make him his own protector against the disease beriberi. The difficulty of the task of changing food habits should not cause us to despair, however.

At the present time, because of the war and its concomitant food shortages, the American people have become sensitized, so to speak, concerning the importance of nutrition and good food. Nutrition classes have been established in almost every community in the land. The Red Cross has undertaken most of this work. Many industrial organizations have also made notable contributions here, particularly those whose chief activity in peacetime is the manufacture of household appliances. These organizations have long employed as demonstrators people trained in home economics and related subjects; and more recently these employees have been utilized in various ways for this new kind of educational work extending not merely to all the employees of the home plant but to people outside as well.[9] These efforts on the part of industry itself, special groups and communities, have been discussed elsewhere.

THE LUNCH-BOX AND NUTRITION

Many workers get their lunch from a lunch-box filled in the home. A recent survey by the State Health Department of Connecticut showed that by far the greater number of industrial establishments in that state had workers who brought their own lunch or who ate at restaurants, "hot-dog" stands and the like located in the vicinity of the plant. Only a relatively few very large plants presented situations that seemed to require special provision of food by the management. It seems evident that solution of the lunch-box problem must involve education of both the worker and his family concerning food values. An interesting attack on this problem is seen in the so-called Bridgeport Plan, a community effort organized and pushed by a local com-

mittee which includes in its personnel representatives of the medical profession, home economists, demonstrators employed by public utility concerns, and still other groups. This is a good illustration of what organized community effort can accomplish in this field.

THE PROBLEM OF THE CONCESSIONAIRE

Some industrial establishments offer to the employees food furnished by a concessionaire. This practice has been criticised by nutritionists on the ground that too often the concessionaire is interested merely in the profit to be made; he says he offers what the workers really want, and he cannot change their food habits. This may be true of many concessionaires, but I am able to find at least one concern engaged in this business which, over a year ago, hired home economists to study and improve the firm's situation. Various foods not commonly offered workers under the concessionaire arrangement have been tried out experimentally and records kept of their acceptability. It appears evident that some at least of the foods believed to be of high nutritive value, and which therefore nutritionists frequently recommend, have in fact a low acceptability as such, and can probably be used to a considerable extent only when worked into recipes of one kind or another; further developments in this field will be awaited with interest. It is certainly a hopeful sign that important units in the food concessionaire business have become aroused to the possibilities for improving their contribution to the feeding of workers.

THE DISPENSING MACHINE

In some plants foods and drinks are made available through dispensing machines, as well as through canteen carts wheeled through the establishment. This situation presents a twofold problem, one concerning the choice of products to be dispensed, the other involving education of the worker in making his choices. The nutritional advantage of offering milk as compared with soft drinks is obvious. In this connection it is only fair to point out that fluid—water—is needed by the body just as much as solid nutriment; and when the need to be met is that for water, milk is not a very satisfactory substitute. Taken as a recognized valuable part of the day's dietary, however, milk is an item for which there is no good substitute.

All of these items, then, have their proper place in the total picture, but too often that place has been enlarged beyond anything that sound nutritional practice can countenance. Experience can be cited in support of the view that most workers, when given the chance over a reasonable trial period, will increase their milk consumption and correspondingly decrease that of soft drinks. Such a result represents of course the effect of educational effort coupled with easy access to the more desirable product.

Another interesting development to be recorded in this connection illustrates how every branch of the food industry has become aware of the part it plays in the total nutrition picture, and the importance, therefore, of making that part a commendable one. Many confections can be dispensed by the machines located in industrial plants. The confectionery industry has been taking active steps to improve the nutritive value of its products, and is now supporting active research in this direction. The desire of the armed forces for various kinds of improved confections has doubtless had something to do in encouraging this.

A survey of our national food resources shows that there are many valuable foods which the American people could use, if they would; good examples are skimmed milk powder,

dried yeast, soybean flour, peanut flour, cottonseed flour, etc. Most of these products probably find their best use as ingredients of foods made according to a recipe. Some commercial products of high nutritive value have already been made from them, and these could of course be used in the lunch-box, or by the concessionaire, or even, in some cases, in dispensing machines present in industrial plants. Owners of such machines now have ample material of high nutritive value to choose from in stocking their machines, and as far as possible should base their choices on known nutritive values of the products.

The science of nutrition has developed to the point where it is quite proper to ask any purveyor of food just how good his product really is, and to expect an answer backed up, if necessary, by actual tests of some kind if the product is not a well known natural food or a mixture of such natural foods.

FEEDING OF SUPPLEMENTARY VITAMINS

The ready availability of various vitamins in pure form has led many industrial concerns to adopt the practice of giving these dietary factors to their employees. The wisdom of this practice, particularly if it involves an indiscriminate use, can certainly be challenged, and has been. One school of thought argues that it has been shown that a large part of the American people do not get sufficient vitamins to support optimal health; that workers in industry constitute a large part of the American population and presumably, therefore, belongs to this group; that this subnormal health is reflected in poorer industrial performance, earlier fatigue, poorer recovery from fatigue, and greater absenteeism; that administration of the vitamin does no harm, any excess not needed by the body being readily eliminated; the vitamins are relatively inexpensive; therefore, it is argued, the administration of vitamins by management to the workers constitutes a valuable contribution of that management to the health of these workers. Against this view can be cited the following line of argument: vitamins constitute only a part of the many dietary factors needed for health (it will be remembered that previously approximately forty individual items were mentioned as being needed for adequate nutrition); a diet of properly chosen natural foods furnishes not only the needed vitamins but other factors as well; therefore, if any dietary factors are needed by the workers, they should be furnished in the form of available natural foods of high nutritive value. To industrialists this means, of course, that the plant should furnish adequate eating facilities, something that is more difficult to do than to give out vitamin concentrates, pills, or capsules. It is doubtless natural, therefore, that many plants should have chosen to give vitamins instead of natural foods.

SPECIAL INDUSTRIAL HAZARDS

Another aspect of the matter deserves comment. There is evidence [10] that workers handling certain chemicals are exposed to industrial hazards against which particular dietary factors may be protective. Foulgar [10] cites trinitrotoluene—TNT—as an example of a toxic chemical against which a high intake of absorbic acid—vitamin C—seems to be of considerable value. There have been reports that the effects of glaring light on vision can be counteracted in considerable measure by the administration of vitamin A; this vitamin has also figured in many discussions as a possible anti-cold agent, and this claim has been vigorously challenged. The value of a liberal supply of B complex vitamins in combating fatigue, and recovery from fatigue appears to

be subject to some debate. These illustrations emphasize to us the need for due appreciation of the *special industrial situation* for which one or more vitamins may be of great importance; and if the data from carefully controlled studies in this field prove a relationship of this type, obviously the dietary factor of interest should be provided, whether it be a vitamin, table salt, calcium, or some other substance. Such an attitude on the part of students of industrial hygiene means merely that there should be a sensible application of the results of good research.

NUTRITION AS A CHALLENGE TO PUBLIC HEALTH

Public health workers can do much to assist in the proper application of the newer knowledge of nutrition to industrial hygiene. They can advise and guide industrial managers and workers' organizations in relation to special situations. They can assist in determining whether the best practices are being followed in the operation of the feeding facilities in the plant; whether these facilities are under competent nutritional supervision; and whether the selections of foods to be offered are the best that can be made in the prevailing circumstances.

The problem of public education in these matters is always with us, and public health workers will of course do their part in organizing local nutrition classes, and either teach those classes or help to find and train others for this work. There are many gaps in our knowledge in this field that must be filled. More studies of various types need to be carried out in industry. Public health workers who should find themselves facing an opportunity to encourage and participate in such investigations, in my opinion, should feel favored indeed; until these many studies have been prosecuted to a successful conclusion, we shall not have explored to the full the many possibilities for human welfare that reside in genuine knowledge of nutrition as a factor important for industrial hygiene.

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Chest X-Ray Survey Methods in Practice

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CHEST x-ray examination of apparently healthy individuals has become an accepted method of tuberculosis case finding. It has been adopted by tuberculosis control agencies throughout this country; it is being employed routinely by the Army and Navy for all members of the armed services, and by the U. S. Public Health Service for workers in war industries. The British Government has recently announced its plans for the chest x-raying of all inhabitants of England. The procedure has even earned the distinction of having a feature article devoted to it in a recent issue of one of the country's leading weekly popular journals.

Three basic chest x-ray survey methods have been developed, the rapid roll paper method, roentgen-photography on 4 x 5 inch film, and roentgen-photography on 35 mm. film. Considerable controversy has arisen concerning the respective merits of these technics. Much of this controversy has been due to lack of familiarity of the participants with the methods in actual survey practice. Studies of the diagnostic accuracy of the three media have been carried out under circumstances bearing little relationship to field conditions of operation in either taking or reading of films. Observers have drawn broad conclusions based on the comparison of a few test or demonstration films. In general, important technical factors in the taking and handling of the x-rays have been left out of consideration in the discussions. The effect of these academic comparisons and generalizations has been to produce a distorted picture of the problem of chest x-ray surveys and to prejudice the reader against one method or another. The subject is far too vital to warrant conclusions founded on such inadequate premises.

The opinions presented in this paper are based on 6 years' experience with two of the three survey methods. From 1937 to 1942 the author was associated with the Bureau of Tuberculosis of the Department of Health of New York City. During this period this agency x-rayed more than 350,000 individuals, using the rapid roll paper method on a contract basis. The work included all phases of survey operation from the planning of space to the reading and filing of films. Since April, 1943, the writer has been connected with a tuberculosis control program among industrial workers in a large shore establishment of the United States Navy. This program, carried out under the supervision of the Senior Medical Officer of the New York Navy Yard, Captain J. W. Troxell (MC) USN., and Comdr. T. R. Meyer (MC) USNR., Industrial Hygiene and Sanitation Officer, has included the taking of chest fluorograms of over 15,000 persons in less than 6 months' time. The 35 mm. roentgen-photographic method, provided by private contract, has been employed.

The work has called for reading of the films, follow-up on cases, and arrangement for the storage and filing of records and films. These two experiences have made it possible to compare the roll paper and 35 mm. roentgenphotographic methods in actual operation in large scale chest x-ray survey practice and have prompted the preparation of this report.

Comparison between the methods can best be made in terms of certain basic factors:

DIAGNOSTIC ACCURACY

In considering the question of the diagnostic accuracy of the different media there has been a tendency to overlook the primary objective of chest x-ray surveys, to screen out cases requiring further examination from those presenting no abnormalities requiring such examination. Some observers have compared the methods on the basis of their accuracy in detecting all pathological conditions. This is extremely valuable from a scientific point of view, but has little applicability in practice where only clinically significant lesions are of importance. Another fallacy has been a tendency toward using survey films as an ultimate criterion. Only lesions of obvious character can be accurately appraised on survey films, and in each instance all methods are satisfactory. If activity is in question, and serial films are required for comparison, the best medium available, 14 x 17 inch celluloid film taken at high speed on powerful machines with small focal spot tubes, must be employed.

When used for screening purposes, survey methods should be judged by three criteria: frequency of retakes for technical reasons, percentage of lesions overread, and percentage of lesions missed. There is little to choose between paper and 35 mm. photo-roentgenographic films with regard to frequency of technical retakes. It is very difficult to secure good reproduction of the chest of very heavy patients with either method and we believe that all survey technics should provide for the immediate use of full size celluloid film in such cases. Even if instances of this type are counted, technical retakes have rarely been necessary. The exact percentage of such retakes varies with the reader and survey, but has not exceeded 1 per cent with either medium, which we consider a reasonable figure.

In our experience the percentage of cases regarded as suspicious on the survey film and negative on the 14 x 17 inch celluloid film has been higher with roentgen-photography than paper x-rays. This is to be expected as the short tube film distance in the former technic tends to exaggerate normal markings. Much of this difficulty can be overcome by thorough familiarity with the medium. It has been noted that the percentage of lesions overread tends to fall sharply as one continues to use any type of x-ray, and consistency in interpretation is reached only after several thousand films have been reviewed. Our percentage of unconfirmed lesions has been less than 0.5 per cent with either medium.

The most important criterion, and the most difficult to appraise, is the frequency of missed lesions. Moderately advanced and far advanced tuberculosis can be detected by all survey methods; minimal lesions will occasionally be overlooked on any type of film and by any observer. Unfortunately, in practice the latter is only determined by the subsequent discovery of the case in other ways, and the vast majority of errors probably remain undetected. In the Navy Yard all cases of incapacitating illness are cleared through the medical department and breakdowns from tuberculosis are readily detected. In the past 6 months we have learned

of only one lesion missed on the initial survey x-ray, and feel justified in assuming that this is a rare occurrence. In our hands both paper and 35 mm. photo-roentgenography have proved sufficiently accurate media for routine survey work.

RAPIDITY OF MAKING EXPOSURES

This has not been a factor of importance with either method. Both are operated at the rate of 500 exposures per unit per day routinely, and this can be increased to 1,000 a day for short periods of time. Since it is rarely possible to reach this number in practice, speed in making exposures is no problem with roll paper or 35 mm. roentgen-photography.

FACILITY IN PROCESSING FILMS

In our work both paper films and fluorograms were provided by private contract, and the company supplying the service was responsible for the processing which was done in its plant. Should it become desirable, however, to assume the complete operation of the survey, including the developing of the films, it can be done readily

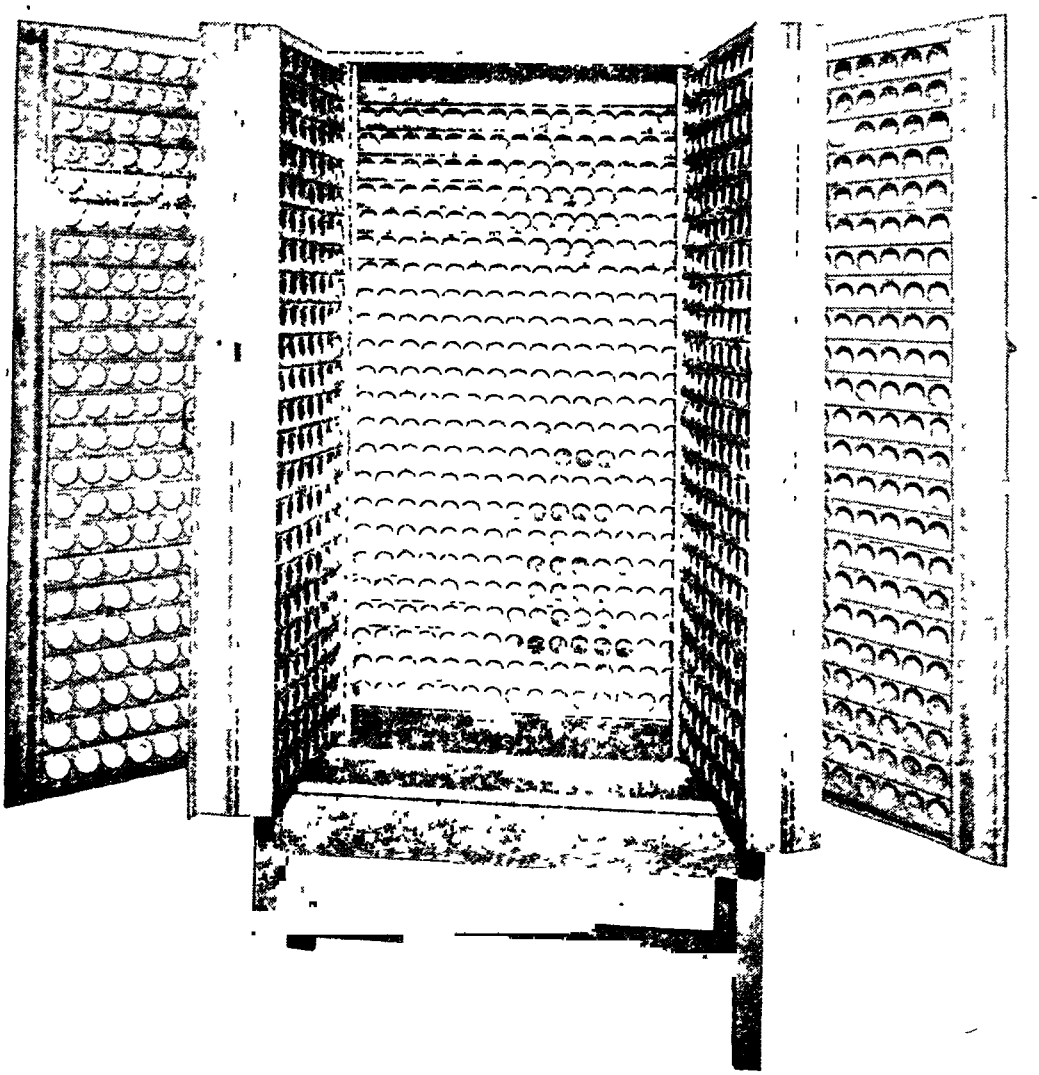


FIGURE 1—Cabinet which holds over 60,000 films

with 35 mm. roentgen-photography by providing a small photographic dark room. This is not possible with paper film at the present time. When transportation of film is a problem, 35 mm. film can be sent by ordinary or air mail, which is a decisive advantage these days.

CONVENIENCE AND SPEED IN READING FILMS

Thirty-five mm. roentgen-photograms can be read much more conveniently than paper film. The rolls of 35 mm. film occupy little space and can be carried easily from place to place. They require no elaborate equipment or special lighting for viewing. A small reading device of low magnification of the type widely used in photography has proved entirely satisfactory for the purpose. The films can be examined in any place where an electric outlet is available, and the work can be adapted readily to the convenience of the reader. With paper film an elaborate viewer with special illumination is required, and the reading can only be done at more or less fixed locations.

Thirty-five mm. film can also be read more rapidly. We have routinely reviewed 400–500 films per hour, including the time alloted for short rest periods. On rare occasions as many as 1,000 films per hour have been read. The normal reading speed with paper films is 200–300 films per hour, with a maximum of 500 films per hour. No greater eye strain has been encountered working with the small films than the full size films at these speeds. There are two principal reasons for the greater speed in reading small films. The more important one is the time saved in changing and turning rolls in the course of reading. A less important reason is the small size of the image on 35 mm. film, all of which can be encompassed by the eye at one glance. With larger films different portions of the chest must be looked at separately, which is more time consuming.

EASE OF FILING FILMS

Roll film can be filed in rolls or individually. In most instances the former method is used. Rolls of 35 mm. film can be kept in a compact filing cabinet so as to be readily available at all times. Such a cabinet, designed and built at the New York Navy Yard, has been described in a recent publication.[1] Two views of this cabinet, which holds over 60,000 films in a space 54 inches x 36 inches x 11 inches, are shown in Figures 1 and 2. No such convenient method for filing paper film is available. In fact, the accumulation of rolls of paper film in large scale survey work presents so great a filing and storage problem that photography of paper x-rays on 35 mm. film has been resorted to. Thirty-five mm. films can also be filed individually with the case record, and in some instances the case record has been so designed as to provide a place for the attachment of the film. The only circumstances under which paper film can be filed more readily is with full size celluloid film. This is necessary in only a relatively small percentage of survey cases.

The above observations apply only to the roll paper method and roentgen-photography with 35 mm. film as used in our work. Other equipment, or the same equipment used under other conditions, may lead to quite different findings. Changes in chest x-ray survey apparatus and technic are occurring so rapidly that such differences are to be anticipated. A new type of cassette for paper film, which makes it possible to utilize existing dark room facilities, is now being tried out. Photo-electric control of exposure factors for roentgen-photography has recently been described. Rotating anode tubes are being tried out for taking survey films. Im-

provements in optical systems, screens, types of film, and developing solutions are the subjects of constant research. These, however, are developments for the future. The comparisons drawn in this paper are based on the methods of today.

Nothing has been said in this presentation concerning 4 x 5 inch roentgen-photography as we have had no experience with this survey method. Numerous reports can be found in the literature concerning its diagnostic accuracy and there appears to be no reason to doubt its acceptability as a screening medium. It does suffer, however, from the drawbacks inevitable in any procedure in which films and cassettes are handled individually. The degree to which this impairs its effi-



FIGURE 2—Section of interior of cabinet

ciency can be appreciated from consideration of the factors mentioned in the previous discussion.

SUMMARY

Experience with the rapid roll paper method and roentgen-photography on 35 mm. film has demonstrated both to be satisfactory chest x-ray survey methods. Both possess a sufficiently high level of diagnostic accuracy for screening purposes. Thirty-five mm. roentgen-photography is the more flexible method, lending itself to the operation on either service or self-operated basis. Its greatest advantage, however, lies in the increased speed in reading and greater convenience in handling of small sized films in roll form. This principle we believe is essential to practical survey operation, and will be a fundamental part of the survey methods of tomorrow.

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ACKNOWLEDGMENT—The author wishes to acknowledge his indebtedness to Captain J. W. Troxell, (MC) USN, Senior Medical Officer of the New York Navy Yard, and Comdr. T. R. Meyer, (MC) USNR, Industrial Hygiene and Sanitation Officer of the New York Navy Yard for their interest and encouragement in this work.

Gonococcus Cultures—A State Laboratory Service*

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SPECIMENS transported by express, bus, or parcel post, for gonococcus culture have been received and examined in these laboratories during the past four years. The procedure and results obtained during the first year have been reported.[1] Owing to the superiority of the results of cultures of shipped specimens compared to those of the microscopic examination of smears on glass slides, further attempts were made to find a satisfactory medium for shipping.

MATERIALS AND METHODS

Specimens—The specimens were obtained from patients attending outpatient clinics for diagnosis and treatment of gonorrhea and from patients referred to their private physicians for examination after having been reported as a source of infection. Cultures were made of all specimens received regardless of treatment being administered to the patients.

Media for shipping—Preliminary experiments using plates and slants of chocolate agar in addition to fluid media were made. Four sterile solutions were used during this study: (a) 0.2 per cent KNO_3 in distilled water, (b) distilled water, (c) horse blood-gentian violet (Cox), (d) ascitic fluid hormone broth. An approximate comparison was made by inoculating two different solutions with each specimen on collection.

Shipping—One gallon hot-cold picnic jugs (Figure 1) were found to be serviceable and convenient for shipping specimens on ice. The material for culture, collected on sterile swabs, was emulsified in 1 to 2 ml. of fluid in 5 ml. vials. At this time two plates of solid medium (McLeod chocolate agar and cystine chocolate agar) were inoculated and a smear was made on a glass slide for microscopic examination. The plates were incubated within 4 hours and were the " control " cultures.

The inoculated vials of fluid were placed in a tin container which was then packed in ice in the jug and shipped to the laboratory. As many as eight specimens were packed in one jug.

Temperature and time during shipping — Preliminary experiments with gonococcal pus were made. Specimens in liquid suspensions were shipped at air temperature, refrigerated at approximately 10° C., and frozen with dry ice. Dry ice was not available in many towns and hence only a few specimens were submitted by this method. Dry ice was better than air temperature in the small series studied. Refrigeration at 10° C. gave better results than air temperature and was used for the routine cultures reported in this study.

In Minnesota specimens are usually delivered to these laboratories 18 to 24 hours after collection. This report of

* Presented before the Laboratory Section of the American Public Health Association at the Seventy-second Annual Meeting in New York, N. Y., October 13, 1943.

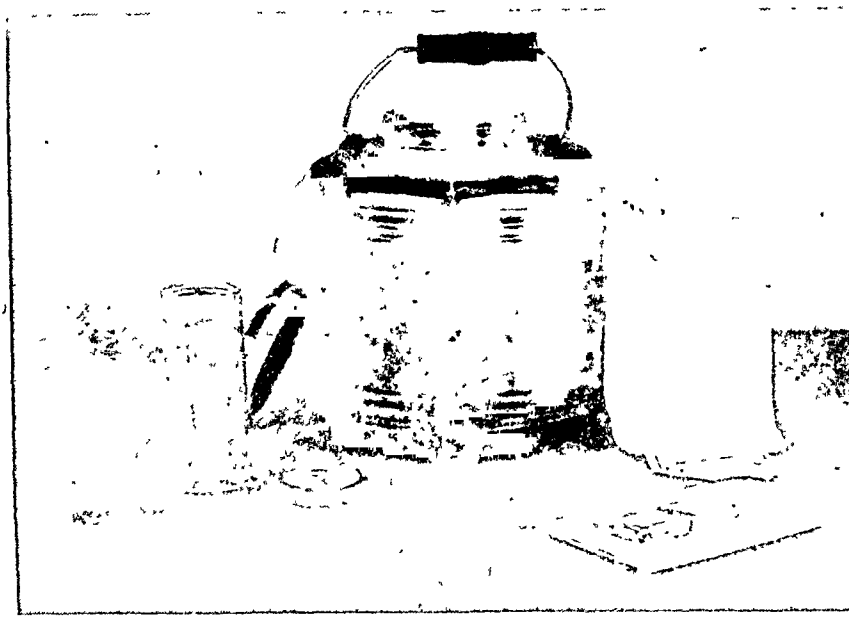


FIGURE 1—Outfit for shipping specimens for gonococcus culture and smear examinations: 2 vials of fluid, tin container for vials, jug, smear outfit which is placed in cotton bag tied to handle of jug.

culture studies is based on a 20 to 26 hour interval.

In making a comparative study of media it is realized that the technic of inoculation should be carefully controlled. However, in routine collection of specimens in various clinics and by different physicians this is not practicable. The results tabulated are from specimens collected routinely and are considered representative of those received in a state laboratory.

Solid media for laboratory use—On receipt in the laboratory each vial of emulsified specimen was plated in duplicate on McLeod chocolate agar and cystine McLeod chocolate agar. Other media were used in addition at times, i.e., Peizer,[2] Nile blue A-egg white, Gardner,[3] Casamino starch agar, Mueller.[4] All solid medium plates were incubated in 10 per cent CO_2 for 48 hours at 37° C.

RESULTS

The results of examination of "immediate" cultures, cultures of shipped specimens and smears are given in Table 1. On *immediate culture* 170 specimens gave positive results and 1,223 were negative. Of the 170 specimens positive on immediate culture 80 or 47 per cent gave positive results after shipment; that is, the results of "immediate" cultures were superior to the shipped specimens by 53 per cent.

Comparing the immediate positive cultures and smears (Table 1) it is noted that the cultures gave 170 positive results compared to 54 given by the smears, that is, there were more than three times as many positive cultures as positive smears. The cultures missed three which were positive on smear examination and the smears missed 119 which were positive on culture. Both cultures and smears gave positive results in 51 specimens.

In the group of *shipped specimen* cultures there were 80 positive cultures against 54 positive smears. The cultures missed 25 specimens which were positive with smears and the smears missed 51 specimens which gave posi-

TABLE 1

Results of Examination of Smears and Cultures of Specimens from 1,393 Clinical Examinations of Gonorrhea Patients

Smears *	Cultures: Present	Cultures: Not Found	Total Smears and Cultures
	Immediate Cultures		
Intracellular	51	3	54
Extracellular	31	99	130
Not found	88	1,121	1,209
Total	170	1,223	1,393
	Shipped Specimens		
Intracellular	29	25	54
Extracellular	15	115 (16)	130
Not found	36	1,173 (52)	1,209
Total	80	1,313	1,393

* Intracellular—means that Gram-negative intracellular diplococci morphologically indistinguishable from the gonococcus were present.

Extracellular—means that Gram-negative intracellular diplococci were not found but that Gram-negative extracellular diplococci morphologically resembling the gonococcus were present.

Not found—means that diplococci resembling the gonococcus were not found.

TABLE 2

*Results of Shipped Specimen Cultures from 170 Clinical Examinations **

	Cultures of Shipped Specimens							*Total*
	Present							
Smears	*Water and Broth*	*Water Only*	*Broth Only*	*Total Present* No.	*Total Present* Per cent	*Not Found* No.	*Not Found* Per cent	*Cultures and Smears*
Intracellular	12	8	0	20	32	9	..	29
Extracellular	1	3	0	4	6	4	..	8
Not found	2	7	0	9	14	16	..	25
Total	15	18	0	33	53	29	46	62
	Water and Blood Violet	*Water Only*	*Blood Violet Only*	*Total Present* No.	*Total Present* Per cent	*Not Found* No.	*Not Found* Per cent	*Cultures and Smears*
Intracellular	0	4	0	4	..	3	..	7
Extracellular	0	3	0	3	..	4	..	7
Not found	0	3	0	3	..	8	..	11
Total	0	10	0	10	40	15	60	25
	Water and KNO_3	*Water Only*	*KNO_3 Only*	*Total Present* No.	*Total Present* Per cent	*Not Found* No.	*Not Found* Per cent	*Cultures and Smears*
Intracellular	3	1	0	4	..	5	..	9
Extracellular	4	0	1	5	..	6	..	11
Not found	5	0	7	12	..	12	..	24
Total	12	1	8	21	47	23	52	44
	Blood Violet and KNO_3	*Blood Violet Only*	*KNO_3 Only*	*Total Present* No.	*Total Present* Per cent	*Not Found* No.	*Not Found* Per cent	*Cultures and Smears*
Intracellular	0	0	1	1	..	5	..	6
Extracellular	0	1	2	3	..	2	..	5
Not found	2	0	10	12	..	16	..	28
Total	2	1	13	16	41	23	59	39

* Immediate cultures from each of these 170 clinical examinations yielded gonococcus colonies.

tive culture results. Both shipped specimen cultures and smears gave positive results in 29 specimens (Tables 1 and 2). Cultures together with smears gave almost twice the number of positives (105) as smears alone (54).

A comparison of the clinical histories and laboratory findings in certain of the groups may be made. Of the 51 specimens which gave positive culture results on shipment and negative smear findings (Tables 1 and 2) 11 were from persons reported as sources of infection, 25 were from treated patients for release, and the remainder (15) were from persons clinically suspected of gonorrheal infection.

In Table 1 the parenthetical figures (16) and (52) show the number of specimens negative on smear examination which gave positive results on immediate culture and negative on shipped specimens, a total of 68. Of these 68 specimens, 12 were from persons reported as sources of infection, 36 were from treated patients for release, and 20 were from patients with clinical symptoms suggestive of gonorrhea.

In addition there were 10 positive cultures of shipped specimens (no immediate cultures available) which were not included in the tables. Six of these were from persons reported as sources of infection on whom clinical and laboratory findings (smears) had been negative. In the remaining 4 cases history was incomplete.

The detailed results obtained with four fluids used for shipment of specimens are given in Tables 2 and 3. The KNO_3 solution appeared to be better than water and water more satisfactory than ascitic-fluid broth for transmission. Possibly the lot of gentian violet used in the horse blood-gentian violet medium contained impurities which were absent in the preparation used by Cox.

TABLE 3

Comparison of Fluids for Shipping Gonococcal Pus for Culture Examination

	Cultures																			
	KNO_3					*Water*					*Broth*					*Blood Violet*				
	+		−			+		−			+		−			+		−		
Smears	*No.*	*%*	*No.*	*%*	*Total*	*No.*	*%*	*No.*	*%*	*Total*	*No.*	*%*	*No.*	*%*	*Total*	*No.*	*%*	*No.*	*%*	*Total*
Intracellular	5	..	10	..	15	28	..	17	..	45	12	..	17	..	29	0	..	13	..	13
Extracellular	7	..	9	..	16	11	..	15	..	26	1	..	7	..	8	1	..	11	..	12
Not found	24	..	28	..	52	17	..	43	..	60	2	..	23	..	25	2	..	37	..	39
Total	36	43	47	56	83	56	42	75	57	131	15	24	47	75	62	3	4	61	95	64

+ = Specimens yielding gonococcus colonies on culture
— = Specimens from which gonococcus colonies were not isolated

SUMMARY

The results of this study indicate that the cultures of shipped specimens are superior to microscopic examination of smears alone for obtaining laboratory evidence of gonococcus infection, where facilities for immediate cultures are not available. Although the shipped specimen cultures were a little less than half as satisfactory as immediate cultures, the former were definitely superior to the smear examinations. The examination of cultures of shipped specimens together with smears yielded almost twice as many positives as smear examinations alone. The use of a simply prepared and inexpensive medium which

will keep on storage at room temperature at clinics and in physicians' offices is practical for routine use.

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Dr. Trask Honored in Naming of a Liberty Ship

The late James D. Trask, M.D., of Yale University, was posthumously honored in May when a Liberty ship named in his honor was launched at the Bethlehem-Fairfield Shipyards in Baltimore, Md. Dr. Trask, who died in Chicago on May 24, 1942, while working for an Army Medical Commission under an appointment as consultant to the Secretary of War, was internationally known for his work in infantile paralysis.

This salute to Dr. Trask and his colleagues who are still carrying on polio research work was suggested by the National Foundation for Infantile Paralysis and the ship is expected to be christened by his widow with prominent scientists from Yale University and Johns Hopkins University present at the launching ceremony.

Dr. Trask and his associate, Dr. John R. Paul of Yale University, received the first grant of the Committee on Virus Research made by the National Foundation after it was organized in 1938. The doctors published many papers on the disease and were honored a month before Dr. Trask's death by the award of the John Phillips Memorial Medal at a meeting of the American College of Physicians.

Block Organization for Health Education*

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THE face to face talk of friend with respected friend is still the most effective means of passing on ideas and information. The radio is potent, but large numbers of people do not own radios, and if they do, one cannot be sure that they listen to the right programs. The newspaper is influential, but many people do not read it, and if they do, they may not read the right sections. But the exchange of talk is universal—in the pool hall, at the farmers' market, at the club, around the pot-bellied stove, in the transcontinental train, at the corner drugstore, or over the back fence, people pour out their ideas. If the talk were directed to one central topic, if the facts on which the talk is based were carefully verified, and if arrangements were made for such talk to go on in every home in the land, you would get a coverage and have a vehicle for public education unparalleled and unexcelled. The OCD Block Plan is a long step toward this objective.

Total war requires the participation of the total population. It is not surprising that soon after the outbreak of hostilities, many communities developed a method for bringing every family into home front war campaigns. This method sprang up spontaneously, independently, and at about the same time in different parts of the country. The basic idea of the method was that one person in each block would be the key distributor of information about war programs. The idea was therefore known as the "Block Plan." This device proved to be so effective that the national Office of Civilian Defense in Washington recommended its adoption throughout the country. As a matter of record and as proof of the grass roots quality of the movement, it is significant that the block plan started *first* on the local initiative of local defense councils, and it was only after a considerable ground swell of operation and interest that the headquarters of the federal OCD adopted it as a part of national policy.

"Thus the Block Plan is simply a method of carrying out home front programs through a block by block organization of neighbors. It is a plan where neighbors can team together for war service with the help of fellow neighbors as their block leaders."

Under this scheme a community is divided into units of a small number of adjoining families. While the number of families in each unit varies in different communities, in general there are from ten to twenty families in each unit. "Each unit, regardless of size, is referred to as a block and may occupy: (a) an entire square city block, (b) a fraction of a square block, (c) one or both sides of a street, (d) an entire apartment building, (e) a fraction of a large apartment building, or (f) a country neighborhood.

Each unit or "block of families"

* Presented before the Public Health Education Section of the American Public Health Association at the Seventy-second Annual Meeting in New York, N. Y., October 12, 1943.

is headed by *one of its own number.* This is a basic feature of the plan and, with such a healthy, democratic quality, helps insure the plan against domination by any one faction, party, or interest. In the early stages of organization, the leaders are usually appointed from a panel of volunteers by some representative of the local defense council, but after the plan gets under way, the appointment of the initial leader is either confirmed by an election of the block group or he withdraws and a new leader is elected to fill the vacancy. All the block leaders are under the direction of sector or zone leaders, who in turn are united under a representative of the Civilian War Services Branch of the local defense council with some title such as chairman of the block plan or chief of the block leader service. Some variation of this plan operates in all types of urban and rural communities in all sections of the country. The term "block" is used to describe the working unit in communities of over 2,500 population, while the term "neighborhood" is applied to working units in communities under 2,500 population. The basic purpose is twofold, first, as already indicated, to secure universal participation of the home front in war programs, and second, equally important but less often utilized, to bring the opinions and suggestions of the rank and file citizen to the attention of civilian defense authorities for the better prosecution of the war. The plan is used for a variety of different programs.

Once the essential machinery of the defense council and block plan is set up, the effectiveness of the block plan depends largely on the *quality* and *training* of the zone, sector, and block or neighborhood leaders. Experience shows that the work of the leader is greatly facilitated if the program has been carefully explained via newspaper and radio. Thorough use of these media identifies the block leader with the program he is attempting to explain, and enables him to concentrate upon getting action and the task of interpreting the program to the family unit. The essence of the educational process is twofold, first instructing the leaders in the program concerned, and second, transmitting the understanding they have thus developed to the families in their "blocks."

The application of the block plan to the field of health education can be made best with a series of illustrations. In Fenton, Mich., war clubs (Block Plan) on their own initiative undertook a program of education designed to bring about a general acceptance of the engagement of a public health nurse. A series of talks and demonstrations were given. These efforts led to a broad interest in public health beyond the original problem of securing the services of a public health nurse. In Fayetteville, N. C., block workers campaigned to encourage inoculations against typhoid, diphtheria, and smallpox. In La Junta, Colo., block workers were used to help check a diphtheria epidemic. The local director writes that, "The block leaders told the families on whom they called about the threat of diphtheria, warning the mothers to have their children immunized, advising them to keep their children with sore throats home from school, and asking if their children would submit to throat cultures." The director continues by saying that they "located 38 carriers of diphtheria and many were quarantined. They checked the spread of diphtheria temporarily at least, which with a shortage of doctors was very important."

In Mount Vernon, Ind., block leaders conducted a campaign to acquaint housewives with the importance of safety in the home, and to enlist them in the Indiana Home Safety Campaign.

In Richmond, Va., block leaders promoted health in their neighborhoods during the month of April, 1943, by forming Health for Victory Clubs, emphasizing the value of nutrition and home nursing, and stressing the advantages of an early diagnosis of tuberculosis. The Richmond block organization also originated campaigns to rid the city of rats. One feature of this effort was a drive to clean up the streets, yards, and alleys, and to beautify the city, as well as to starve the rats into an appetite for poison. Through the neighborhood leaders, Waldo County, Me., increased by 24 per cent the local use of enriched flour and bread in preference to plain white flour and bread. An excellent and effective program for making a survey in an attempt to stamp out infantile paralysis was made in Fort Worth, Tex., under the joint auspices of the Fort Worth and Tarrant County Health Departments, the Tarrant County Chapter of the National Foundation of Infantile Paralysis, and the Tarrant County Office of Civilian Defense. Another effective program for the elimination of rats, garbage disposal, and the control of the yellow fever mosquito was undertaken in New Orleans.

A very promising project of education for the prevention and control of venereal diseases was undertaken in one section of Wayne County, Mich. By adroit management, the coöperation of outstanding civic, religious, and municipal leaders was secured. Groups of block leaders received lectures and read pamphlets on the problem of venereal disease. After their instruction, leaders passed the information on to their neighbors. The coverage was not complete, but was more effective than anything heretofore attempted in that area.

Two more projects, in greater detail, will complete the material of this presentation. For the first, I quote part of a letter dated July 2, 1943, written by Mrs. Allen C. Selmin, Executive Secretary of the Neighborhood War Clubs of Detroit, to Reginald Foster, who was then chief of the War Services Branch, OCD, Washington, D. C.

"*History of the Project:* About a half million persons have moved into Detroit in the last year and a half. The local Board of Health was anxious to continue their fine record, despite the fact that they had lost many nurses to armed services and private agencies. They therefore requested Neighborhood War Clubs to do the survey which their own nurses had been accustomed to do; a survey which would determine the danger spots in the city. They were particularly interested in knowing what families had arranged for immunization against smallpox and diphtheria.

"*The Project:* The Board of Health prepared the enclosed forms: the pink form to be filled out on each family in the city, the yellow ones to serve as instruction to the block leader who was doing the interviewing. These were distributed by Neighborhood War Clubs to block leaders who called on all the families in residence in a square block for which they were responsible. The forms were then returned to this office, coded, and when ten to twenty had been received from a block, were sent on to the Board of Health. That agency then made up the statistical reports.

"*Results of the Project:* At the present writing, about 50,000 of these reports have been sent to the Board of Health and, according to the annual report from that organization, have served the purpose for which they were intended. The results were limited by the fact that the block organization in Detroit was not complete. We are still sending these forms to block leaders as new blocks are organized in the city, and the Health Survey becomes the first project of a new leader. Block leaders find householders interested in

health problems. They are concerned about the dangers to their children who go to school with the children of families recently moved to Detroit.

"As a result of this service given to the Board of Health by Neighborhood War Clubs, we have recently been asked by them to take on a new project. The highest incidence of tuberculosis in Detroit is in the downtown, or transient, area. This falls within three of the four zones in Area 10. Our zone, sector, and block leaders are now making appointments for residents of these zones to have x-rays taken. Block leaders are attempting to do an educational job in this part of the community. This is being done under the supervision of a staff member of the Board of Health, who has been loaned to Neighborhood War Clubs for this job and for a health education job throughout the community."

For my last example, I will take a page from some pre-war experience which I had in one of the rural counties served by the W. K. Kellogg Foundation in southern Michigan. While the block plan was not in existence at that time, the Branch County Community Corporation was in the fields of health and child welfare roughly equivalent to a county defense council. I quote from the February, 1939, University of Michigan School of Education *Bulletin:*

"During the summer of 1938, the Branch County Health Department was in need of certain important data with regard to the health of the children in the county. The chairman of the Branch County Community Corporation was approached for aid in securing these data, and he presented the problem to the corporation. One delegate from each of the one hundred and five school districts was then appointed to membership in a seminar on county health problems. For several meetings over a period of two weeks this seminar gathered to participate in a discussion led by the members of the staff of the county health department, dealing with the physical welfare of the children in the county. In the course of these discussions, an interview schedule was described and the members of the seminar were instructed in its use. Each delegate applied the schedule to every family in his respective school district. These data were turned in to the office of the county health department for tabulation. This is probably the first time a complete inventory of the physical welfare of children has ever been secured in any area as large as Branch County. It was accomplished without any cost to the county. The process of adult health education for the one hundred and five delegates securing the data and for the families they interviewed was very effective."

In conclusion, I want to stress one basic and inescapable fact. All programs designed to enrich the lives of people and communities suffer from a universal plague. They reach and affect only a paltry fraction of the public for whom they are intended. Many of us talk to other professionals about what should be done with the great unwashed. Others reach a few laymen who in general are the least needy of the population. We rarely touch the man who needs it most, and if we do, for everyone we reach, there are thousands who never hear our story.

The OCD Block Plan is the most effective cure for this plague that I know. Nothing approaches it in coverage and the possibility of universal education under grass roots leadership. If I were a professional in public health education in the United States, I would do everything in my power to build up the OCD Block Plan in my community and to see that it is used for a problem that is vital in war and in peace, namely, the protection and development of the health and fitness of the general public.

Preparing High School Students for Community Service*

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THE long-range objectives of the community health service course for the high school girl in Michigan are:

1. Broaden her vision and develop an awareness of community health problems and resources for solving them.
2. Develop an understanding of her responsibility for safeguarding and improving individual, family, and community health.
3. Develop competence in procedures and skills for dealing with illnesses, emergencies and similar health problems.
4. Develop an interest in and appreciation of selected health professions, such as nursing, medicine, public health, dentistry, laboratory work, and nutrition.

Two incidental and more immediate objectives, directly related to the war, are:

1. To provide overcrowded and understaffed hospitals and other health agencies with sorely needed assistance.
2. To recruit student nurses for the United States Cadet Nurse Corps.

The pressing nature of these immediate objectives focuses attention strongly upon the ineffectiveness of the theoretical and practical training for healthful living and care of the sick in the average school. These are sadly neglected subjects as compared with their importance in the life of the individual. The millions of young men and women, rejected by the armed forces and the war industries because of physical or mental defect or disability, testify to that fact. These young people must feel bitter toward a supposedly enlightened nation that failed to teach them and their parents how to prevent the great bulk of these disabling illnesses and injuries. Physical and mental fitness is a dominant factor in winning the war. The survival of a nation and its influence in the postwar world will depend largely upon the health and vigor of the individuals who make up its population. The high school girl, the future mother of the race, is in a strategic position to do more to improve health conditions than any other person.

More emphasis has been placed in the school curriculum upon healthful living and care of the sick in the W. K. Kellogg Foundation's seven-county Michigan Community Health Project than in most places, but it took a war and the acute shortage of nurses in the coöperating hospitals to force the issue. Nurses deserted the hospitals to join the armed forces or to follow their husbands to training camps. Older women in these smaller communities with leisure time to become Red Cross nurse aides are relatively few in number. The armed forces and the high wages paid unskilled workers in war industries attracted the younger women. That left the high school girl as the only important source of woman power to fill the gap, and it was discovered that she was ready, willing, and anxious

* Presented before the Public Health Education Section of the American Public Health Association at the Seventy-second Annual Meeting in New York, N. Y., October 12, 1943.

to do her part. She had an uneasy feeling that she was not making her full contribution to the war effort. Her high school brother was in the Victory Corps and her older brothers and sisters were in the armed forces or war industries.

When some 40 girls in the Lakeview School, located in a suburb of Battle Creek, who had discussed the subject in class with their teacher, petitioned the school authorities to give them training that would fit them for voluntary service in the overcrowded and understaffed local hospitals, officials of the Foundation were consulted. They enthusiastically approved the project, not only as a war measure but as a permanent part of the high school curriculum. That was one year ago.

When the superintendent of public instruction approved the project, he asked the Foundation for sufficient funds to try it out in 20 high schools during the second semester. The number was increased to 26 when 80 high schools asked to be included. The home economics teacher at the Lakeview School and the teacher of health subjects in the Ann Arbor schools, who is a registered nurse, sacrificed their Christmas vacations to outline the course. Two of the schools decided to make it compulsory for all senior girls and the other 24 offered it as an elective. Approximately 1,000 girls were enrolled.

The directing committee was composed of representatives from the Departments of Public Instruction and Health and the State Board of Control for Vocational Education. A committee of experts evaluated and revised the course content this past summer on the basis of experience.

The planning group is usually composed of the school administrator, the teacher, the nurse consultant, the hospital administrator or administrators, if there is more than one hospital in the community, and the health officer. They inventory the local health agencies, such as the health department, hospital or hospitals, maternity, well-baby, immunization and other clinics, Red Cross, tuberculosis association, family welfare agency, school health service, municipal sewage disposal plant and water works, physicians, dentists, and visiting nurse association, and they map out the teaching program so far as these agencies are concerned.

A suitable classroom instructor, usually the home economics teacher, teaches the course with the assistance of a nurse consultant. The nurse supervises the training and practical experience of the students in the hospital, health department, or other health agency and assists the classroom teacher with the theoretical instruction. The usual classroom period is one hour a day with an additional hour of practical experience.

Unit I includes a survey of local health agencies and personnel and an appraisal of their adequacy to serve the community effectively.

Unit II is an analysis of the health status of the student and includes a complete physical examination. This is planned as a learning experience and is required before the student goes to the hospital for practical experience. One class discovered from the chest x-rays that one-third of its number had previous tuberculosis infection. This led to a case finding program in the whole school. Another class discovered how few students had been immunized against the preventable contagious diseases. They conducted a campaign to have all students immunized.

Unit III has to do with family health, with particular reference to the mother and infant, and includes control of communicable diseases, home nursing, family relationships, and sex education.

In Unit IV, community health, the activities of the local health agencies, including the health department, come

in for more detailed study. It includes school health, the environmental factors affecting health, and mental health of the adolescent.

In Unit V the girl learns about nursing skills.

Unit VI is a study and analysis of the health professions, including nursing, medicine, dentistry, nutrition public health and the clinical laboratory, and the opportunities for service in these fields.

The course was offered in the senior year, but a few juniors were enrolled. The girls elected to take the course with mixed motives, as might be expected. Some had decided upon nursing as a career and, strange to relate, when they got a taste of it a few decided it was not what they wanted to do. This course should cut the 35 per cent mortality the first year in schools of nursing. Other girls, who had no predilection toward nursing, decided that was what they wanted to do. Still others took the course because they had completed all their required subjects and this elective appeared to be a snap. They were in for a shock, but they bore it nobly.[1]

Some 300 of the 1,000 students enrolled indicated that they planned to enter schools of nursing. Others went to work as regular hospital employees, and a few are taking up medicine, dentistry, clinical laboratory work, and dietetics. The suggestion that high school boys should also be enrolled in the course is also being given careful consideration.

The girls usually become very impatient to get into the hospitals and other health agencies during the first two or three weeks, which are devoted entirely to classroom instruction. More instruction occurs in the hospital before they are allowed to put into practice what they had been taught in the classroom. Department heads lecture on the functioning and why and wherefore of their particular departments. Then the girls are allowed to perform the tasks for which their preliminary training has fitted them, such as answering calls from patients, folding linen, repairing rubber gloves, cleaning up the room and making empty beds after patients have been discharged, running errands, and helping to prepare trays and feeding the patients. After they became more proficient they were given additional responsibilities in nursing the patients.

In the health departments they visit with the public health nurse and sanitary engineer. In one community they discovered sanitary conditions in a trailer camp were far short of ideal. When they appeared before the city fathers, the mess was promptly cleaned up. Food handling in restaurants and bakeries was bad in another community. They did something about that.

One student, on a prenatal visit with a public health nurse, confided to the nurse her own need and that of her friends for "sex education." A later classroom discussion resulted in a panel discussion before the student body on boy and girl relationships. A physician, nurse, minister, parent, teacher, and student were on the panel. This and later discussions caused the formation of a planning committee, composed of a representative from each high school grade, a teacher, from each of the elementary and secondary schools, and community leaders. This committee is working out a program to improve social relationships among boys and girls. An interested civic group plans to finance the services of a psychiatrist to aid in a continuing program.

Everyone connected with the project—teachers, nurses, hospital administrators, health officers—was most enthusiastic about its possibilities. Many of the girls put in extra hours working in the understaffed hospitals that were not required by the course. The assist-

ant principal of Highland Park School in Detroit writes:

> We started out this course with three sections, the third . . . added by popular demand. The interest . . . increased during the semester. I have talked . . . with many of the girls . . . most enthusiastic about it . . . a definite contribution to the curriculum. . . . The wife of one of the leading doctors at Henry Ford Hospital thinks it is the finest course her daughter has ever taken. The daughter is an excellent student . . . preparing for Vassar College . . . significant evaluation by an intelligent person.

Comment by a hospital administrator:

> The students are well informed in elementary nursing procedures, painstaking in their work, and, above all, eager to make themselves useful. Several of these girls have already developed vocational interest in nursing . . . while all of them think that the course has been conducive to better health, both for themselves and for their respective families.

The American Hospital Association has taken the bulletin,[2] published jointly by the Michigan Departments of Public Instruction and Health for use as a handbook by schools and health agencies, and sent it to all its 3,200 member hospitals with a recommendation that the hospitals get behind this on a nation-wide basis.[3] It means much to hospitals now in the way of practical help with the care of patients and the recruiting of student nurses. It also enlarges their opportunities for community service and increases their prestige as centers of health education.

This school year (1943–1944) over 200 Michigan high schools will give the course. About 50 of the larger schools that graduate classes in February will offer it in both semesters. The plan is, after this year, for the Michigan Department of Health, through coöperation of its county health units, to take over responsibility for the nurse consultant and planned training of the students in the local health agencies. The idea is spreading to other state departments of health and public instruction and to Great Britain. Some twenty states are negotiating with the W. K. Kellogg Foundation for financial assistance in getting the course started.

This is primarily a health education venture in which the schools and health agencies coöperate to give high school girls training that is both theoretical and practical in healthful living and care of the sick. They and their progeny should make better soldiers and war workers in the next war. If that war does not happen, the nation, so far as Michigan is concerned, should be much better equipped mentally and physically to maintain its prestige and leadership in the post-war world, a practical application of the fruits of positive health.

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American Journal of Public Health
and THE NATION'S HEALTH
Official Monthly Publication of the American Public Health Association

Volume 34 June, 1944 Number 6

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THE U.S.P.H.S.

THIS has been an important year for the Public Health Service in two respects. The first of these is the reappointment for a new term of Surgeon General Parran. The earnest devotion and the administrative skill with which he has conducted his difficult task have made him an ideal public servant; and a leader whom the rest of us in the public health profession are proud to follow.

The second event of the year is the passage of the U. S. Public Health Service Reorganization Bill. This bill simplifies and coördinates the work of the Service under four main bureaus: the Office of the Surgeon General (including, among others, Divisions of Public Health Methods, of Dentistry, and of Sanitary Engineering); the National Institute of Health which remains the research arm of the Service; the Bureau of Medical Services (which includes Quarantine and Mental Hygiene); and the Bureau of State Services (which includes Venereal Diseases and Industrial Hygiene). Thus, final administrative authority is concentrated in four channels, rather than ten or twelve. The chiefs of the four bureaus and the heads of certain divisions acquire a rank comparable with that of Brigadier General in the Army which is a welcome acknowledgment of the importance of their work. Dentistry and engineering, in particular, occupy more important positions than before. It is perhaps unfortunate that public health nursing did not receive similar treatment. On the whole, however, the reorganization makes for efficiency and recognizes the prestige which the Service has so fully earned.

The Bulwinkle Bill (H.R. 4624), now before Congress, will clarify and codify all the laws relating to the Service; and should further strengthen the work of the organization.

TRAINING IN TROPICAL MEDICINE

ON the inception of a war which carried our armed forces into the tropics, it became an urgent necessity that the medical personnel of the Army and Navy should be trained to meet the problems of disease prevalent in those areas.

This has been accomplished with notable success by intensive courses in tropical medicine at the Army and Navy medical schools, by the publication of new text-books and directives, and by the practical experience of medical personnel with the armed forces in tropical regions. The program of War-Time Graduate Medical Meetings at military hospitals in this country has also included lectures on tropical diseases.

Training has been extended into the medical schools by a program involving travelling lecturers, intramural courses and field experience for instructors, and the provision of teaching material. In this program the Army and Navy, the U. S. Public Health Service, the Office of the Coördinator of Inter-American Affairs, the National Research Council, Tulane University, the John and Mary R. Markle Foundation, the Rockefeller Foundation, the Commonwealth Fund, and the United Fruit Company have coöperated with the Association of American Medical Colleges. The American Foundation for Tropical Medicine, through the support of commercial firms, has made grants to a number of medical schools to encourage teaching and research. The primary purpose of this program is to furnish a background in tropical medicine to medical students who will soon become officers in the Army and Navy.

In addition to training personnel for the active prosecution of the war, it is necessary to look forward to future needs. Although we have been assured that if proper precautions are taken there is little danger of the establishment of tropical diseases in this country on the return of our troops, the medical profession and public health agencies must be on the alert to diagnose and treat cases which occur, and to prevent their spread to the civilian population. The increase of air transportation which will continue after the war, and which will bring occasional cases of tropical diseases into the country, also emphasizes the importance of preparedness. Furthermore, American participation in the rehabilitation of occupied areas, and in the long range task of improving health conditions throughout the world in the post-war period, present a challenge calling for adequate training of the civilian medical profession and of public health personnel.

Some steps have already been taken to meet this need. The DeLamar Institute of Public Health at Columbia University has established a full-time Department of Tropical Medicine. Tulane, Columbia, and the University of California are giving short courses for physicians this spring. The American Society of Tropical Medicine has a committee which is planning an educational program for physicians. Many state and county medical societies are including tropical medicine in programs of their meetings. A few state and local health departments have promoted programs in malaria and other parasitic diseases, and have also taken steps to give more extended training in tropical medicine to epidemiologists and laboratory directors. In this training the Army Medical School, the U. S. Public Health Service, and the Association of American Medical Colleges have been and are willing to coöperate. Other state and local health departments would do well to develop such a program which might well be coördinated by the leadership of the U. S. Public Health Service. Not only will it prove profitable to discover and control possible factors in the transmission of tropical disease, but those participating in such training will be fascinated with the life cycles and identification of parasites and with the intricacies of their epidemiology. No field of medicine holds more interest for the student of disease prevention. It is a cause for satisfaction that we, in the United States, are at last making a concerted attack on the problem.

WHO KILLED COCK ROBIN?

THE reduction of the death rate by approximately 40 per cent during the first four decades of the present century is one of the most significant events in human history. In such an achievement, there is glory enough for all. Health officers, public-spirited private practitioners, engineers, nurses, laboratory investigators, social workers, educators have all participated in the task.

To claim the fruits of victory for one individual professional group is therefore unwarranted. To associate them with a particular sector of one profession operating on a particular economic plan is still more unjustifiable. Yet this is what has been attempted in the flood of propaganda literature issued by the publicity staff of the "National Physicians Committee for the Extension of Medical Service" and distributed on a vast scale through the medium of certain agencies in the drug trade. The committee states that it has printed 20 million copies of one of these leaflets, which claims that the achievements of the past years have been accomplished by "American Doctors" operating under "the American system"; and it is obvious that, by the American system, is meant the private practice by individual physicians on a fee-for-service basis—since the entire flood of this propaganda is directed against any further participation by government in the development of more adequate medical care. Such an argument obviously raises the question whether American doctors practising on the particular system which the National Committee prefers, or on the equally "American" plan of official public service, deserve a major share of credit for our reduced death rates. As Governor Smith used to say: "Let's look at the record." The pertinent points of this record are indicated in the following table:

CHANGES IN MORTALITY

1900–1940

	Death Rate per 100,000		*Per cent Reduction*	*Actual Deaths*	*Deaths Which Would Have Occurred in 1940 at 1900 Rates*	*Number of Lives Saved per Year*
	1900	*1940*		*1940*		
Typhoid and paratyphoid fevers	35.9	1.1	97	1,443	47,173	45,736
Diphtheria	43.3	1.1	97	1,457	56,896	55,439
Diarrhea and enteritis	133.2	10.3	92	13,573	175,025	161,452
Measles, scarlet fever, and whooping cough	34.8	3.2	91	4,300	45,727	41,427
Tuberculosis	201.2	45 9	77	60,428	264,377	203,949
Pneumonia and influenza	180.5	70.3	61	92,525	237,177	144,652
All other causes	1,126.1	944.5	16	1,243,543	1,479,695	236,152

In this table are shown the actual results accomplished between 1900 and 1940 in the reduction of mortality from the five causes of death with which the organized health forces of the community have been concerned, and also the corresponding reduction in pneumonia and influenza, where responsibility has been shared between the public health officer and the private physician. The last line of the table includes the changes in mortality from all other causes taken together. Many of these have also come within the scope of the public health program.

It will be noted that typhoid fever and diphtheria mortality rates have been reduced by 97 per cent. The results accomplished in the case of typhoid fever have been due to the work of the engineer, to purification of the public water

supplies, improvement in sanitary conditions, and to epidemiological control and immunization programs, conducted by health officers. In the case of diphtheria, administrative control, and the use of antitoxin and later toxoid, are responsible for the accomplishment. The basic discoveries in these fields were made by men like W. H. Park working in public health laboratories, and introduced by health officers like Hermann M. Biggs, often in face of vigorous opposition from the practitioner.

Diarrhea and enteritis of infants has been reduced by 92 per cent through the pasteurization of milk supplies, under the leadership of public health authorities and through the establishment by boards of health and visiting nurse associations of well baby clinics for the instruction of mothers. Here again the initiative came primarily from the organized health forces representing the public interest.

The group of infectious diseases of childhood, measles, scarlet fever, and whooping cough, have shown a 91 per cent reduction in mortality, due in large part to vigorous and energetic epidemiological control on the part of public health authorities. Tuberculosis, which has been cut down by 77 per cent, represents the result of a program carried on in nearly all its phases through the leadership of public health departments, public health clinics, and publicly maintained sanatoria. Here, again, it should be recalled that the introduction of the first program for the reporting of tuberculosis was strenuously opposed by the medical profession.

In the case of pneumonia and influenza the practising physician deserves a lion's share of the credit. Even here, however, it should be pointed out that the basic discoveries in regard to serum treatment and the use of sulfa drugs were made by salaried physicians in the employ of public health laboratories and foundations and universities, rather than by private practitioners.

It seems certain that the organized public health profession rather than the private medical practitioner is responsible for a major part of the gains which have been made during the past forty years.

It is no doubt true that the "Other Causes" of death listed in the last line of the table are much more difficult to control than those which the public health administrator has so successfully attacked; but it may be hoped that a sound system of prepayment which will make good medical care available to the lower economic half of the population, now woefully lacking in such services, would produce notable results in the reduction of many other causes of death than those which have so far been successfully attacked.

BOOKS AND REPORTS

This Milk Business—A Study from 1895 to 1943—*By Arthur Guy Enock. London: H. K. Lewis & Co., Ltd.*, 1943. 243 pp. Price, $4.75.

A realistic discussion is presented of the production, processing, and distribution of milk in England, drawn from the author's experience of more than 40 years as a consultant on dairy and refrigerating problems. A plea is made for increased milk consumption in England, better official regulation and control of sanitation, and a fair return to farmers without undue increase in retail price.

The importance of pasteurization is stressed. The use of the process of holding milk at 145° to 150° F. for at least ½ hour is urged as against high-temperature, short-time pasteurization at 162° F. for at least 15 seconds. The author claims that high-temperature pasteurization damages certain food properties of milk and that the holding time for installations in England is uncertain. For this reason and because milk pasteurized by both the low- and the high-temperature processes often is placed in unsterile bottles, the author urges in-bottle pasteurization as the ideal process. Good laboratory results are reported on samples of milk from large plants in England bottling milk at 145° to 146° F. and holding it for 30 minutes in air in an insulated holding chamber. Lower cost per gallon is claimed for the in-bottle process as compared with regenerative heating. Actual figures are not given as they are considered to be confidential.

Many problems discussed are somewhat similar to those confronting us in the United States. However, the author's views on such things as the bad effect of high temperatures for short times on the food properties of milk, the need for an upper limit in the definition of pasteurization, the superiority of inspection over the testing of the milk itself, and the uncertainty of the holding time for high-temperature, short-time pasteurizers are not in accordance with experience here.

W. D. TIEDEMAN

Micromeritics — *By J. M. Dalla Valle, M.S., D.S. New York: Pitman*, 1943. 428 pp. Price, $8.50.

This very interesting and comprehensive volume summarizes in a most exhaustive way the whole field of the technology of fine particles.

The volume deals with material in the fine state of subdivision from many points of view, covering the subject in 18 chapters, each one devoted to an important aspect of the problem. Many of these are not of direct interest to the public health worker; for example, chapters such as the Dynamics of Small Particles; the Electrical, Optical and Sonic Properties; Thermodynamics of Particles, Capillarity; Muds and Slurries; and the Theory of Fine Grinding.

Several of the chapters are of more direct interest to the public health worker, such as the chapters dealing with Methods of Particle-Size Measurement; Determination of Particle Surface; Transport of Particles; the Collection and Separation of Particulate Matter from Air; and Atmospheric and Industrial Dust, the latter, of course, being the chapter of most interest to the public health worker.

The volume is exhaustive in its treatment of the subject and in each case deals with basic formulae in a critical and comprehensive manner.

The chapter dealing with Atmospheric and Industrial Dust concerns itself with the dispersion of dust and smoke, atmospheric pollution, industrial dust, particle sizes of industrial dusts, methods of sampling and analysis, and finally closes with a brief but concise discussion of the subject of the control of industrial dust.

The volume is well printed, contains numerous references to the literature, and closes with a valuable bibliography of some 38 pages. There is an appendix containing useful constants and conversion factors of frequent occurrence in this field.

This book should be in the hands of everyone really interested in the field of the technology of fine particles and, so far as the public health worker is concerned, it should prove a useful reference volume.

LEONARD GREENBURG

A Manual of Methods for Organizing and Maintaining a Central Tuberculosis Case Register — *By Edward X. Mikol, M.D. New York: National Tuberculosis Association,* 1943. 70 pp. Price, $1.00.

Only one who himself has been through the experience of setting up a central tuberculosis case register can fully appreciate the advantage now available to all through the publication of this *Manual* by the National Tuberculosis Association. The author has a background of wide experience as a member of the staff of the Division of Tuberculosis of the New York State Department of Health and the *Manual* has been prepared in coöperation with the statistical service of the N.T.A.

The central case register is presented as a superior administrative device intended as an aid in the operation of the tuberculosis control program. Such a register should preferably be maintained by a county or city health department, or by a tuberculosis hospital. The *Manual* declares that the decision to establish a case register is wise only when the local tuberculosis control program is and has been well organized under competent supervision. The author and the Association are to be congratulated on this publication.

REGINALD M. ATWATER

On the Influence of Trades, Professions, and Occupations in the United States, in the Production of Disease—*By Benjamin W. McCready, M.D., 1837. Baltimore: The Johns Hopkins Press,* 1943. (With an introductory essay by Genevieve Miller, M.A.) 129 pp. Price, $1.75.

This book is Volume IV in the Fourth Series: Bibliotheca Medica Americana, representing the publications of the Institute of the History of Medicine, The Johns Hopkins University.

For those who are interested in or doing industrial hygiene, medicine, and health work, this book represents one of the most important volumes in the history of the development of industrial and occupational medicine in this country.

The original material was written as an essay in a contest sponsored by the Medical Society of the State of New York in 1835, for which the prize was $50. Dr. McCready wrote the book at the age of 23 and had been graduated only two years before from the College of Physicians and Surgeons, and had served a term as house physician at the New York Hospital. The author was considerably influenced by the book published in England in 1831 by Dr. C. Turner Thackrah, whose book was the second all-inclusive monograph on occupational diseases, following Ramazzini's immortal work in 1700.

Included as chapter headings are those with reference to agriculture, laborers, housing, seamen, factory operatives, artizans, professional men, liter-

ary men, and general causes of poor health.

The essay represents a remarkably mature and realistic approach to the problem of occupational diseases as it occurred in the early 19th century in America. Remedial proposals are forecasts of the future when housing codes were established and when industrial establishments provided safety devices, proper ventilation, shorter working hours, recreational activities, and convenient sanitary facilities. Particularly foresighted was Dr. McCready with respect to health education for the masses, the principles of which are not yet extensively and generally applied in industrial groups.

The book deserves the most careful perusal and reflection of industrial physicians and others who should understand the economic and social background of American industry. The publishers are to be congratulated on an invaluable contribution to American industrial medical literature.

C. O. SAPPINGTON

Dona Eugenesia y Otros Personajes—*Edited by Dr. Manuel Gonzalez Rivera, Professor of Health Education in the School of Health and Hygiene. Mexico: Talleres Tipograficos Modera, S. A., Comonfort 44, Mexico, D. F.,* 1943. 210 pp.

This readable little book in health education was compiled from the home work of physicians and nurses studying in Mexico's School of Health and Hygiene. Out of their personal experience as physicians and nurses, they wrote to good effect of disease and hygiene in stories, poems, radio dialogues, and brief texts that might be used as "spot" announcements of health services.

Dr. Manuel Gonzalez Rivera, who teaches health education and is also director of health education for Mexico, selected the items for this book from the work of his pupils. He also contributed the opening story, "Dona Eugenesia," which tells how one girl learned that gonorrhea may wreck a marriage and what she did about the problem of gonorrhea in her own engagement. The other authors treat of venereal disease, tuberculosis, typhoid fever, malaria and other diseases, of their prevention and their cure. They stress the help that people may secure from clinics, from doctors, nurses, and sanitarians in getting well and staying well.

These writings have flavor as well as health information. Market sanitation, for example, is expounded in the poem "Don Candelario" by Dr. Fernando Fernandez Alfaro. "Un cuento de amor . . . y de limpieza" by Eva Villaneuva Vega is a folk story of personal hygiene.

Directors of health education and teachers will be interested in this adventure in health education. Teachers who wish to direct their pupils to the health problems of other countries will be glad to find it.

Dr. Gonzalez in introducing the book says that it was designed particularly to aid the doctors and nurses who work in the rural areas.

HAZEL O'HARA

Dental Facilities in Philadelphia—A Survey of Sixty Dental Clinics—*Philadelphia: Health Division, Council of Social Agencies,* 1943. 46 pp.

The foreword of this report opens with the statement that inquiries such as this "begin with the assumption of some kind of inadequacy." The inadequacy of dental care in American cities for those who must depend on clinics for such attention is a matter of record, but it is well nevertheless to have it brought home from time to time.

This report states that in Philadelphia 500,000 children of preschool and school age were in need of immediate

dental care, and that 70 per cent of these children received no reparative dental treatment whatever in the year the study was made. No estimate was given as to the situation for adults, but the inference is permissible that it was essentially the same.

The purpose of the study was to "assemble facts which would be used as guides in planning for the future a satisfactory . . . dental program." The study was planned to show resources for the dental care of the indigent and how these resources could be used to the best advantage. Agencies offering dental care were classified as to type (hospitals, non-hospitals, dental schools) and as to geographical distribution. The various agencies were then examined as to facilities, staffs, and services offered. Tables show clearly the situation under these headings for the various types of clinics. Exclusive of the dental schools it was estimated that 75,000 patients were served during 1942.

This study was entirely objective, no effort being made to develop pleas for more dental care for the population of Philadelphia or to stress the health value of regular dental care. For that reason the recommendations deal largely with things as they are—the best use of present facilities and man power, urging, however, increased funds to secure more paid dental personnel to put all present dental chair hours to work.

The report does, however, provide much factual material which can be used in campaigns to arouse public interest in dental health, especially for the child population. It is an excellent study of its type.

JOHN OPPIE MCCALL

Prepayment Medical Care Organizations—*By Margaret C. Klem. Social Security Board, Washington, D. C. (November, 1943.) Bureau Memo. No. 55.* 252 pp.

The Bureau of Research and Statistics of the Social Security Board has prepared this memorandum for the use of its staff and for limited circulation to other administrative and research personnel concerned with the subject of prepayment medical care. It contains brief, one page digests of the essential facts regarding about 250 prepayment plans. REGINALD M. ATWATER

Medical Parasitology and Zoölogy—*By Dr. Ralph Walty Nauss. New York: Hoeber,* 1944. 534 pp. Price, $6.00.

After long experience in the teaching of medical parasitology and zoölogy to students of the Cornell Medical College in a limited period of ten weekly sessions of 3 hours each the author has condensed the practical essentials of these broad subjects into a text of less than 400 pages, exclusive of Appendices and the Glossary.

Part One deals in seven chapters with pathogenic and commensal protozoa, including amebae, flagellates and sporozoa, with special chapters on amebiasis and malaria.

Part Two in three chapters has to do with parasitic helminths, with particular emphasis on those causing disease.

Part Three in four chapters deals with insects and their direct or indirect relation to disease transmission.

Part Four in three chapters treats of venomous reptiles, stinging insects and injurious aquatic forms of animal life.

There are nine Appendices covering 101 pages on technical methods essential to the study of animal parasites, including excellent descriptive classifications of venemous reptiles.

In the Glossary is an identification key of animal parasites and arthropods, which more logically belongs among the Appendices. The Glossary proper could well have been omitted, in that it contains only a fraction of the technical terminology employed in the book.

Likewise it contains too many simple terms, such as rectum, ovary, mucus, habitat, and fang, with which even high school students should be familiar.

The presentation of the subject matter is concise, factual, and current. There are 16 pages of excellent bibliography.

The book is unusually well illustrated with 95 figures and 15 tables. With few exceptions these have been borrowed from acceptable sources, and have been properly accredited.

Not only to the medical student, but also to the clinician and laboratory technician this book should be very useful for both instruction and ready reference. T. F. SELLERS

The Education of Nurses—*By Isabel Maitland Stewart. New York: Macmillan,* 1943. 399 pp. Price, $3.50.

This book is most timely and should prove a springboard and guide to the profession as well as an orientation for the ever-widening circle of people not in the profession whose work is increasingly concerned with nursing. In these trying times the profession needs all the perspective it can get and non-nurses need to have nursing interpreted to them. The book furnishes a basis for meeting both needs, as well as a challenge.

In the first six chapters, nursing is described concisely from its earliest beginnings in primitive society through the Christian era to the time of Florence Nightingale (1860) "when nursing came into its own as a separate secular profession"; through the transplanting of the Nightingale system in this country (1873–1893), the subsequent periods of professional self-government, legislation (1893–1913), studies of cost, administration, curriculum, and emergence of the collegiate type of school (1913–1933), and fundamental readjustments up to the present day (1933–1943). The meat and the challenge are in the last two chapters, in which the author discusses with clarity and wisdom a dozen or so important problems, some old, some new. The most fundamental seems to the reviewer "the need for a reconstruction of our philosophy of nursing education to make it more consistent within itself and to bring it into harmony with accepted democratic principles and with modern methods of education." Efforts to solve our other problems will be conditioned by the extent to which we think through and reshape our philosophy.

Throughout, nursing education is discussed in relation to the social milieu of the times. One of the book's chief values lies in the careful portrayal of nursing education in relation to the forces which have impinged on it—the church, army, medicine, education, science, etc.—through relatively static societies to the rapidly changing order of today. Nursing in the total social setting and its stake in democracy are the unifying threads and "if we are to pursue a steady upward trend" our leaders must have such a concept. Miss Stewart offers real help which should enable us so to plan and act that "what is best for the community as a whole, not what nurses want for themselves, must be the prime consideration, though the rights of the professional group must be safeguarded."

MARY C. CONNOR

Childbirth Without Fear: The Principles and Practice of Natural Childbirth—*By Grantly Dick Read. New York: Harper.* 259 pp. Price, $2.75.

In this book Dr. Read explains his theory that childbirth without physical complications should be painless because reproduction is a natural function for all living creatures and no physiological function in the body gives rise to pain under normal conditions.

He recounts his search for the cause of the pain usually associated with childbirth. He explains how fear disturbs the neuromuscular harmony of the uterus as labor begins, how the resulting tension causes the pain and impedes the orderly progress of the natural physiological processes of childbirth. He does not tell us how the fear originated, how pain first became associated with childbirth. He outlines how fear is now passed along from person to person, from generation to generation by suggestion, hearsay, public opinion, literature, religion, and the kind of obstetric care which assumes that pain is inevitable and, without seeking its cause, attempts to alleviate it with analgesics, anesthetics and artificial interference to hasten the birth of the baby.

In chapters on Education in Pregnancy and Labor, the Conduct of Labor, and Relaxation, Dr. Read describes his care and instruction of patients during pregnancy and labor to help them eliminate the fear and overcome the tension that causes the pain.

He quotes from case histories to prove that under normal conditions labor can be not only practically painless but a pleasant experience that is followed immediately after the birth of the baby by an overwhelming ecstasy with physical reactions that reduce the blood loss and hasten involution. He devotes considerable space to discussing the questions, doubts, and objections called forth by his earlier book about natural childbirth.

The human race always abandons its traditions with reluctance. The lay, no less than the professional mind, doubts revolutionary theories and practices until they are tested by several workers other than the discoverers. One can hope that *Childbirth Without Fear* will soon be followed by reports of the testing of Dr. Read's theories and practices. In the meantime, doctors, midwives, and nurses can ill afford to miss reading this book. Dr. Read is a physician of broad experience. His convictions about the significance of the emotional factor in the mechanism of labor are based on his education in biology, physiology, and neurology, which included work with the scientific pioneers who discovered the "influence of the sympathetic nervous system upon the activities of the viscera, the causes and interpretation of painful stimuli, and the visceral reactions to emotional states." Such convictions can't be lightly discarded, particularly when the significance of the emotional factor is being emphasized in all human behavior, in all physiologic processes, in dysfunction, in pain, in disease.

HAZEL CORBIN

Applied Dietetics — *By Frances Stern. (2nd ed.) Baltimore: Williams & Wilkins,* 1943. 265 pp. Price, $4.00.

This is the second edition of Miss Stern's valuable book; the first edition was published in 1936. This edition has been enlarged and greatly improved to meet changing needs and in order to include newer knowledge of the application of dietetics which has resulted from the rapid advances of this science.

This book lays down the principles for the prescription of a therapeutic diet, coördinating the findings and recommendations of the doctor, dietitian, social worker, and nurse. The normal diet is first discussed, showing that all therapeutic diets must vary from the normal according to physiological findings, which may call for a decrease or increase of the normal food constituents.

The computation of diets and menus is greatly simplified by the numerous tables and lists of equivalent foods. Food constituent values are also given for the recipes of the more common foods.

Complete outlines are given for treat-

ment of such conditions as food allergy, vitamin deficiencies, ulcer, obesity, constipation, colitis, nephritis, diabetes, and liver disorders.

The book is highly recommended for teachers of dietetics, and is a most useful reference book for physicians, hospital and clinic dietitians and all others who have a special interest in this field. OCTAVIA H. SMILLIE

BOOKS RECEIVED

TROPICAL NURSING. By A. L. Gregg. 2nd ed. New York: Philosophical Library, 1944. 185 pp. Price, $3.00.

PLENTY OF PEOPLE. By Warren S. Thomson. Lancaster, Pa.: The Jacques Cattell Press, 1944. 246 pp. Price, $2.50.

THE PSYCHOLOGY OF WOMEN. By Helene Deutsch Vol. I. New York: Grune & Stratton, 1944. 399 pp. Price, $4.50.

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SMALL COMMUNITY HOSPITALS. By Henry J. Southmayd and Geddes Smith. New York: The Commonwealth Fund, 1944. 182 pp. Price, $2.00.

THE HISTORY OF MINERS' DISEASES. By George Rosen. Introduction by Henry E. Sigerist. New York: Schuman's, 1943. 490 pp., ill. Price, $8.50.

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A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

RAYMOND S. PATTERSON, PH.D.

The Peak Seems Past—In 1943 the United States experienced the highest incidence of meningococcus meningitis in the 30 years of Public Health Service morbidity experience. In 1929 (the next highest year) the case fatality ratio was about 50 per cent. In 1943 it is estimated at 18 per cent. Sulfonamide therapy is given credit for most of the difference.

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Odd Items Department—It seems that some swing musicians labor under the delusion that they achieve otherwise unachievable heights of virtuosity under the influence of marihuana. A group of incarcerated addicts were given a synthetic marihuana and, though their musical performance deteriorated measurably, they thought they were wonderful. I don't know what good it does to tell *you* this.

ALDRICH, C. K. The Effect of a Synthetic Marihuana-like Compound on Musical Talent as Measured by the Seashore Test. Pub. Health Rep. 59, 13:431 (Mar. 31), 1944.

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DOCK, W. Use and Abuse of Bed Rest. New York State J. Med. 44, 7:724 (Apr. 1), 1944.

About the Rickettsias—In handy form, you will find here all you will probably need to know about typhus, spotted fever, tsutsugamushi and Q fevers. In this symposium are papers which treat in the same inclusive way the subjects of diarrheal diseases and the malarias. The series will prove a useful addition to your clipping library.

DYER, R. E. The Rickettsial Diseases (and two other papers). J.A.M.A. 124, 17:1165 (Apr. 22), 1944.

Young Women at Hard Work—Economic Status is the major determining factor in tuberculosis incidence in young women, concludes this study. Tuberculosis mortality is not significantly greater among employed women than among women generally of the same age and economic status. Before the war is over we may have some statistics which will cause us to qualify this generalization.

DORAN, M. V. Tuberculosis in Employed Women. Am. Rev. Tuberc. 49, 2 (Feb.), 1944.

Despite Lost Ration Books—There was no evidence found that rationing had any adverse effect upon the food habits of certain Baltimorians, reports

this study. Young people do better by the stomachs than do their opinionated or ignorant elders.

DOWNES, J., and BARANOVSKY, A. Food Habits of Families in the Eastern Health District of Baltimore in the Winter and Spring of 1943. Milbank Quart. 23, 2:161 (Apr.), 1944.

When Johnny Comes Marching Home—Malarious — Skeleton teams of entomologists and engineers are in the making by the U. S. Public Health Service to survey, inspect, and institute mosquito control measures where malaria carriers are present. These teams will be available for assignment to work under state direction. This would seem to be an aid which wide-awake administrators would book tentatively and in advance.

FREEBORN, S. B. Problems Created by Returning Malaria Carriers. Pub. Health Rep. 59, 11:357 (Mar. 17), 1944.

Maybe It's Because the Rich Are Getting Poorer!—That ancient gag-song " the rich get richer and the poor get children " no longer is true to life (in either direction) apparently. This study of birth rate behavior among New York City's white population finds a continuing trend toward contracting differentials in fertility among rich and poor. It is in the higher income groups that the increase in fertility is occurring.

JACOBSON, P. H. The Trend of the Birth Rate among Persons on Different Economic Levels, City of New York, 1929–1942. Milbank Quart. 23, 2:131 (Apr.), 1944.

Compound Tincture of Round Table—Annotating an ably edited digest surpasses in futility the gilding of gold refined to 24 karat. So, it is enough here to point out that this digest is one to be read thoughtfully by every living soul among us.

KISER, C. V. Implications of Population Trends for Post-war Policy. Milbank Quart. 23, 2:111 (Apr.), 1944.

Healthful Housing — Redevelopment of substandard urban areas is our number one post-war civic problem says the writer who introduces what constitutes another series of outstanding articles on this public health hazard with which all of us, no matter what our particular job may be, should be concerned.

LASKER, L. D. The Call of Our Cities (and seven related papers). Survey Graphic. 33, 4:197 (Apr.), 1944.

Nursing Insurance—Either nursing is a luxury service for the rich, or the poor are denied something they should have. Though no one can foretell if he will be sick and need nursing services during the coming year, it is possible to predict in any community the amount of nursing care which will be needed during that period. Hence, the insurance principle is applicable. Nurses, says this authority, have good cause to interest themselves in the whole movement to distribute costs of illness, and, he adds, the time to plan for post-war adjustments is now.

MOUNTIN, J. W. Suggestions to Nurses on Post-war Adjustments. Am. J. Nurs. 44, 4:321 (Apr.), 1944.

Anent " Cold Sores "—This may not be new to you, but it seems that herpes simplex infection normally takes place in early childhood, and that the virus remains latent presumably in the cells near the circumoral site of the primary infection, ready to pop out under the stimulus of excessive light, heat or cold, or another disease. Adult primary infection is unusual. Live and learn, say we.

NAGLER, F. P. O. A Specific Cutaneous Reaction in Persons Infected with the Virus of Herpes Simplex. J. Immunol. 48, 4:213 (Apr.), 1944.

In Memorium to the Word " Level "—Lack of progress in the effective control of gonorrhea, should

have been the title of this wholesomely frank discourse upon bargain-basement dosing methods. The paper is strong medicine for v. d. officers, but it has a lesson in it for all of us. By its resort to the phrase "at the dispensary level" this paper reduces to the ultimate level of scientific gargon (at the medical paper level) that sadly overworked word "level"—and this barb is leveled at all the writers of whatever level who prate about things "at the state level" or "at a nuisance level." Please, let's all let "level" die awhile—level!

PELOUZE, P. S. Progress in the Wartime Management of Gonorrhea. Ven. Dis. Inform. 25, 2:42 (Feb.), 1944.

And Are You One of the 2,500,000?—At the end of last year the Red Cross had collected 5 million pints of blood (from about half that number of donors). Through thirty-five centers approximately 45 per cent of the country's population has the opportunity to donate this greatest of all life-saving elements for our wounded soldiers and sailors. Because of experienced personnel and standardized methods, operational losses are minimal.

TAYLOR, E. S., and HEISS, M. E. American Red Cross Donor Service. J.A.M.A. 124, 16:1100 (Apr. 15), 1944.

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WAYSON, N. E., and MCMAHON, M. C. Plague. Sulfadiazine Treatment of Guinea Pigs Infected by Artificial Methods or by Flea Transmission. Pub. Health Rep. 59, 12:385 (Mar. 24), 1944.

Susceptibility to Rheumatic Fever Is a Recessive Characteristic—This is about the potentially rheumatic family as a public health objective. Medical supervision of the rheumatic patient is not the end of the hygienist's responsibility.

WILSON, M. G. Hereditary Susceptibility in Rheumatic Fever. J.A.M.A. 124, 17:1188 (Apr. 22), 1944.

ASSOCIATION NEWS

SECOND WARTIME PUBLIC HEALTH CONFERENCE AND
SEVENTY-THIRD ANNUAL BUSINESS MEETING
AMERICAN PUBLIC HEALTH ASSOCIATION
New York, N. Y., October 3–5, 1944
Headquarters: Hotel Pennsylvania

MEETING OF THE COMMITTEE ON PROFESSIONAL EDUCATION

THE Committee on Professional Education of the Association met on April 21 in New York under the Chairmanship of W. P. Shepard, M.D., of San Francisco. This was the first meeting of the committee since its reorganization at the time of the Wartime Conference in New York last October. At that time the committee was dissolved and reconstituted by Governing Council action to consist of 12 members appointed for 3 year terms, 4 members retiring each year. As it now stands the committee is well equipped to carry out its immediate plans and to chart an ambitious course for the future.

Among the many encouraging reports received dealing with recent progress was one from the Subcommittee on Merit Systems of which George H. Ramsey, M.D., of Ann Arbor, Mich., is Chairman. Believing that the membership will wish to know what goes on behind the scenes so far as the preparation of an examination is concerned, excerpts from Dr. Ramsey's report follow.

"As prepared by the Merit Systems Unit (the staff employed to carry on this project), a completed examination consists of a large number of multiple choice questions or items. A single examination may contain 200 or more items.

"The customary procedure in assembling an examination begins with the appointment of a consultant who is a specialist in the field to be covered. He takes part in the collection and preparation of items and in the assembling of examinations.

"Experience has shown that the best items come from workers in positions similar to that for which the examination is being held, rather than from those in directing or academic positions. Accordingly, the consultant and other members of the Merit Systems staff request field workers to construct items and teach those who comply how items should be prepared. Field workers serving as item constructors are paid a small fee for each acceptable item. More than 140 field workers have already served as item constructors.

"Items collected in the field are submitted to a group of reviewers, who are directors, or are in supervisory positions in the field to be covered. They criticise each item and pass judgment as to its validity and practical value. Approximately 147 directors or supervisors in health agencies have served without compensation as reviewers up to the present time.

"Items approved are revised, edited, and placed in suitable form by the consultant, the psychometrician, and other members of the staff. A record is kept of each item showing where and when it has been used and success or failure in giving the correct answer. In



AMERICAN PUBLIC HEALTH ASSOCIATION COMMITTEE ON PROFESSIONAL EDUCATION MEETING

APRIL 21, 1944

Left to right: Standing: Reginald M. Atwater, M.D., *Secretary,* New York N. Y.; W. W. Bauer, M.D., Chicago, Ill.; Wilson G. Smillie, M.D., New York, N. Y.; Robert D. Defries, M.D., Toronto, Ont.; George H. Ramsey, M.D., Ann Arbor, Mich. Seated: Lowell J. Reed, Ph.D., Baltimore, Md.; Ralph E. Tarbett, C.E., Washington, D. C.; John Sundwall, M.D., Ann Arbor, Mich.; W. P. Shepard, M.D., *Chairman,* San Francisco, Calif.; Pearl McIver, R.N., Washington, D. C. (Absent when photo was taken: Gaylord W. Anderson, M.D., Washington, D. C.; Edward S. Godfrey, Jr., M.D., Albany, N. Y.; Ernest L. Stebbins, M.D., New York, N. Y.; Clair E. Turner, Dr.P.H., Cambridge, Mass.)

assembling items for an examination, the qualifications for admission are taken into account.

"Material covering positions in the following public health activities thus far assembled and ready for immediate use are: General administration (health officers), 800 items; public health nursing, 1,500 items; environmental sanitation, over 200 items; and laboratory service, 900 items.

"Greatest progress has been achieved in the field of public health nursing. Sixty-five examinations purchased from the Association have been held in 15 states and one city and arrangements for examinations in several other states are pending. Examination material has been prepared with consultation and assistance from appropriate outside agencies in two specialized fields, nurse midwifery and orthopedic nursing.

"Thirteen examinations covering laboratory positions have been purchased by three states and one state has purchased examinations for three positions in environmental sanitation.

"It is expected that work in the field of environmental sanitation will be expanded at an early date to cover positions in public health engineering, and plans are under way for the preparation of examination material covering positions in venereal disease control.

"When first organized at the request of the Children's Bureau and the United States Public Health Service, the Merit Systems Unit undertook to fulfil an urgent need for examination material. This need has been met in several branches of public health work, and examination material of a high quality, better than can be obtained from most other sources, is available. An orderly procedure for preparing examinations has been adopted and successfully put into effect. The Unit is organized and equipped to function smoothly in its original task and to meet increased demands for examination material at the end of the war.

"The Association has engaged in several other merit system activities besides the preparation of examinations. These have had to do with general promotion and making known the necessity for, and the value of, adequate systems for the selection of personnel. A member of the Merit Systems staff has spent considerable time in the field, holding discussions and conferences with numerous agencies and with all national nursing organizations with the view to promoting a better understanding of the basic principles of merit system activities. There is need for further interpretation of the place and functions of merit systems to both lay and professional groups, particularly in states where such systems have been recently organized.

"Obviously, consideration must soon be given to broadening the scope of the Association's activities in this field. There are many specific problems in the selection of personnel and in the evaluation of services which demand research and study. Also requests for assistance from state merit system agencies in other fields of endeavor in addition to the preparation of examinations are to be anticipated. It is to be hoped that funds can be made available so that the Merit Systems Unit will be able to expand its work according to future needs and to undertake special studies of new problems that arise."

A report on the Educational Qualifications of School Physicians, prepared by a Subcommittee of which Charles C. Wilson, M.D., of New York, is Chairman, was received with interest. It was felt desirable to consult with other interested groups such as the National Education Association and the American Association of School Administrators before proceeding with publication of the report. The committee welcomes comments and criticisms from interested outside agencies as well as from the membership of the Association before seeking approval of the Governing Council on all its reports. This one is expected to be published in the September JOURNAL.

Among essential health services there are specialized activities, each of which calls for a medical administrator who is a physician qualified both in his particular specialty and in the general field of health administration. Such activities are in the fields of maternal and child health, tuberculosis control, venereal disease control, cancer control, mental hygiene, and industrial hygiene. For medical personnel engaged in these activities the Committee on Professional Education has prepared a report entitled "The Educational Qualifications of Medical Administrators of Specialized Health Activities." It has already received the approval of the committee and will be published in an early issue of the JOURNAL. It has been suggested that consideration might eventually be given to the matter of qualifications for medical administrators in the field of public medical services and perhaps also in hospital administration. This the committee has under advisement and it may well be that a statement will eventually be formulated.

It will be recalled that in 1939 the Governing Council approved a report on the Educational Qualifications of Health Officers. Within the last year it has become apparent that, with the changing times, there is need for a more up-to-date report on this subject. Accordingly a revision has been prepared and has had careful consideration. It will appear in the JOURNAL within the next few months prior to its submission to the Governing Council for approval.

A report on the Educational Qualifications of Executives of Voluntary Health Agencies was presented to the committee which points out that there are some 3,000 voluntary health associations in the United States. Because of the notable trend in voluntary health agencies to broaden their health programs rather than to concentrate on a particular specialized health problem, the report prepared by a subcommittee of which George J. Nelbach of New York is Chairman, outlines the broad basic training which an executive should have. It is anticipated that its publication will prove of interest to a large number of persons.

The Educational Qualifications of Public Health Dentists was another report received for further consideration. After the necessary editorial changes this will be published in the JOURNAL

A revision of the report on the Educational Qualifications of Professional Personnel in Sanitation, originally approved by the Governing Council in 1937, was presented by the Referee, Ralph E. Tarbett, C.E., of Washington, D. C. This report deals only with per-

sonnel on the graduate level, whereas the earlier statement covered those on the subprofessional level as well. After further study the report will be circulated for comments and subsequently published.

The matter of field training of public health personnel was the subject of a report presented by Wilson G. Smillie, M.D., of New York, Chairman of the subcommittee of the same name.. Discussion brought out the need for the greater utilization of such centers and the proposal that an agency like the American Public Health Association might at some future time attempt to evaluate existing centers.

Of prime concern to the Committee on Professional Education is the serious need for adequate compensation for professional personnel in public health, particularly in view of the higher standards which have been established along the lines of qualifications and experience. The Governing Council and the Executive Board have gone on record as encouraging the committee to take whatever steps seem desirable to attain this objective. Various professional societies have already been approached with a view to securing their coöperation in assuring remuneration comparable to that for similar skilled professional services within the community. The Officers of the Association's Sections have been asked whether they would be willing to undertake a study of the problem among their own members. When all the facts are in hand it is hoped that a united front of all professional public health workers can be presented.

A request from the National Conference for Coöperation in School Health Education for coöperation in reconciling the reports which have been issued by various agencies regarding functions and qualifications of school physicians, nurses, teachers, and other school health personnel was considered. The committee expressed its willingness to coöperate in bringing about the desired coördination.

The desirability of certifying schools of public health at some future date was again considered. While there is general agreement as to the necessity for such an undertaking by an appropriate agency, the committee felt that such a project must wait until after the war.

For several years the committee has deplored the multiplicity of degrees and certificates awarded by universities in the United States and Canada in the graduate field of public health. Encouragement was expressed by the decline in this trend last year. During the academic year 1942–1943, 20 different degrees and certificates were awarded as compared with 27 in the previous academic year.

The committee was gratified with the report that since 1936 it has distributed more than 20,000 reprints of reports dealing with educational qualifications, and it expressed satisfaction with the wide acceptance and, in many instances, actual application of these standards.

ISABEL LANDY FANTEL
Associate Secretary

APPLICANTS FOR MEMBERSHIP

The following individuals have applied for membership in the Association. They have requested affiliation with the sections indicated.

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Martha R. Bullock, Room 305, Bank of America Bldg., Church and Main Sts., Visalia, Calif., Exec. Sec., California Tuberculosis Assn.

Aloysius S. Church, M.D., River Park (17-C), White Plains, N. Y., Medical Director and Psychiatrist, Lincoln Hall, Lincolndale, N. Y.

Virginia G. Garnett, 2480 16th St., N.W., Washington, D. C., Asst. to Vice-President, Lily-Tulip Cup Corp.

Frances Greene, 1257 N. President St., Jackson 23, Miss., Asst. Supervisor of Health Education, State Board of Health

Doris M. Hinman, M.S., 8811 Euclid Ave., Cleveland 6, Ohio, Asst. Curator, Dept. of Health Education, Cleveland Health Museum

Lillian Kasparian, 312 Talbot Ave., Dorchester Center 24, Mass., Public Health Educational Worker, State Dept. of Public Health

Kum Pui Lai, M.A., P. O. Box 3348, Honolulu 1, Hawaii, Exec. Sec., Tuberculosis Assn. of Territory of Hawaii

Charlotte MacKelvie, 56 Kenwood St., Pittsfield, Mass., Public Health Educational Worker, Div. of Adult Hygiene, State Dept. of Public Health

Vernon Merrill, M.S., 246 North First East, Price, Utah, Member, City Board of Health

Lucy R. Milligan, 350 Madison Ave., New York 17, N. Y., National Commander, Women's Field Army, American Society for the Control of Cancer

Harriet B. Moore, Ed.D., 327 Central Park West, New York 25, N. Y., Instructor, Dept. of Physiology, Health and Home Economics, Hunter College

Charles V. Morgan, 1125 Tuscarora Ave., Elizabeth City, N. C., Public Health Consultant, Lily-Tulip Cup Corp.

Inez Patterson, 179 W. 137th St., New York 30, N. Y., Health and Physical Education Director, Harlem Y.W.C.A.

Veda B. Reddy, R.N., 710 Kanawha Blvd., W., Charleston, W. Va., Staff Nurse, School Health Service, Kanawha County Schools

Eugene D. Sawyer, 180 W. 135th St., New York, N. Y., Director of Health and Physical Education, Harlem Branch, Y.M.C.A.

Claire M. Slattery, M.S., 45 Second St., San Francisco 5, Calif., Field Representative, California Tuberculosis Assn.

Donald C. Smelzer, M.D., C.M., Germantown Hospital, Philadelphia, Pa., Managing Director, Germantown Dispensary and Hospital

N. E. Uelmen, D.D.S., 615 Wells Bldg., Milwaukee, Wis., Dentist

Sarah E. Yarborough, County Health Dept., Elizabeth City, N. C., Health Educator, Pasquotank County Health Dept.

Public Health Nursing Section

Virginia Arnold, R.N., 3818 Chestnut St., Philadelphia 4, Pa., Supervisor and Consultant in Venereal Disease Control, City Health Dept.

Helen Bailey, R.N., 229 S. 6th St., Livingston, Mont., Public Health Nurse, State Dept. of Health

Marie I. Bestul, R.N., 411 12th Ave., S.E., Minneapolis, Minn., Instructor, Dept. of Preventive Medicine, University of Minnesota

Mildred P. Burns, R.N., 475 Bronx River Rd., Yonkers 4, N. Y., Supervising Public Health Nurse, Westchester County Health Dept.

Jean C. Conner, 5026 Ohio St., S.W., South Charleston 3, W. Va., Director, Home Nursing, Kanawha-Clay Chapter, American Red Cross

Anna Dittmer, Havre, Mont., Hill County Public Health Nurse

Mrs. George T. Douglas, R.N., M.A., 17 North St., N.E., Atlanta, Ga., Divisional Supervisor of Nurses, Migratory Labor Health Assn.

Christel Edwards, 910 Esplanade, New Orleans, La., Maternity Supervisor, City Health Dept.

H. Elizabeth Hittle, 814 N. Raynor, Joliet, Ill., Asst. Supervising Nurse, Will County Health Dept.

Laura Merck, 2028-6th St., Peru, Ill., Staff Nurse, State Dept. of Public Health

Harriet Russell, R.N., Route 2, Boise, Idaho, Senior Public Health Nurse, States Dept. of Health

Sammie Greene Shapiro, R.N., Health Dept., Maryville, Tenn., Acting Principal Public Health Nurse, Blount County Health Dept.

Geneva M. Theis, R.N., P. O. Box 764, Lewistown, Mont., Fergus County Public Health Nurse

Iva G. Wait, R.N., 2209 Lawndale, Flint, Mich., Girls' Counselor, General Motors Corp.

Lt. Margaret Wells, A.N.C., 20 Berkeley Road, Maplewood, N. J.

Eleanor Wood, R.N., 228 Napa Rd., Vallejo, Calif., Director, Vallejo Chapter, American Red Cross, Visiting Nurse Service

Florence J. Woods, R.N., P. O. Box 368, Sacramento 2, Calif.

Epidemiology Section

Guillermo Acosta, M.D., Celis Aquilera, Fajardo, Humacao, Puerto Rico, Physician in Charge, Venereal Disease Clinic

Albert Blau, M.D., 102 Lincoln Rd., Brooklyn, N. Y., Physician in Charge, Social Hygiene Clinic, New York City Dept. of Health

Lt. Comdr. Jarvis D. Case, M.C., U.S.N.R., Epidemiological Unit 24, Naval Operating Base, Norfolk, Va., Epidemiologist

Paul T. Chapman, M.D., Herman Kiefer Hospital, Detroit 2, Mich., Director, Tuberculosis Hospitalization and Field Service, Dept. of Health

Abel de Juan, M.D., M.P.H., 17 Nueva St., Santurce, Puerto Rico, Chief, Bureau of Epidemiology, Dept. of Health

Marion L. Enevoldson, 2307 43rd Ave., San Francisco, Calif., Director, Case-finding, California Tuberculosis Assn.

Filipe Lopez-Sierra, M.D., M.P.H., Quinta Chonita, Avenida Coello, LaFlorida Caracas, Venezuela, S. A.

Harold Orr, M.D., D.P.H., 329 Tegler Bldg., Edmonton, Alberta, Canada, Director, Div. of Social Hygiene, Provincial Dept. of Public Health

School Health Section

W. R. Bodine, State Dept. of Health, Austin, Tex., Education Consultant

Iris Boulton, M.A., 1946 Orrington Ave., Evanston, Ill., Head, Dept. of Physical Education for Girls, New Trier Township High School

Donald S. Goudey, D.D.S., 5216 Village Green, Los Angeles, Calif., Supervisor, Dental Unit, Health Service Section, Los Angeles City Schools

Dental Health Section

Carlos A. Criner, D.D.S., San Francisco 306, Altos, Habana, Cuba, Head, Dental Dept., Health Bureau

Clifton O. Dummett, D.D.S., Meharry Medical College, Nashville, Tenn., Teacher of Public Health Dentistry

Helen F. Dyett, D.H., 9 High Street, Auburn, Maine, Dental Hygienist, American Red Cross

Eleanor Hamrock, 414-14th St., Denver, Colo., Dental Hygienist, Denver Public Schools

John V. Killion, D.D.S., 1930 Chestnut St., Philadelphia 3, Pa., Asst. Dentist, Dept. of Health

Harry B. Millhoff, D.D.S., Ohio Dept. of Health, Columbus 15, Ohio, Chief, Dental Division

Robert Turpin, Jr., D.D.S., 429 Madison, Jefferson City, Mo., Dental Health Officer, State Health Dept.

Unaffiliated

Delwin M. Campbell, D.V.S., 7632 S. Crandon Ave., Chicago 49, Ill., Editor, Veterinary Magazine Corp.

Valeria Logue, 600 North St., Jackson, Miss., Asst. Purchasing Agent, State Board of Health

Marianna Packard, 57 Post St., San Francisco, Calif., Exec. Sec., Northern California Union Health Committee

Marjorie Toland, 455 Broad St., Meriden, Conn., Medical Social Worker Supervisor, Bureau of Child Hygiene, State Dept. of Health

Frank J. Walter, 1933 Pearl St., Denver, Colo., Hospital Superintendent, St. Luke's Hospital

DECEASED MEMBERS

Henry H. Asher, M.D., Manistique, Mich., Elected Member 1938, Health Officers Section

Clarence M. Baker, Madison, Wis., Elected Member 1914, Charter Fellow 1922, Engineering Section
John F. D. Cook, M.D., Pierre, S. D., Elected Member 1939
Charles E. Finlay, M.D., Havana, Cuba, Elected Member 1940, Elected Fellow 1942, Unaffiliated
Percy F. Murray, Peabody, Mass, Elected Member 1929
Harry B. Neagle, M.D., Providence, R. I., Elected Member 1918
John Overton, M.D., Nashville, Tenn., Elected Member 1927, Health Officers Section
Adrien Plamondon, Montreal, Quebec, Canada, Elected Member 1931
Herman M. Schoberg, St. Paul, Minn., Elected Member 1923
Blanche F. Sigman, Copley, Ohio, Elected Member 1941, Public Health Nursing Section
Robert M. Stith, M.D., Highlands, Wash., Elected Member 1925
A. L. Stone, M.D., Camden, N. J., Elected Member 1920
Lewis W. Waters, New York, N. Y., Elected Member 1937

CLOSING DATE FOR SUBMITTING FELLOWSHIP APPLICATIONS

Members who may be interested in applying for Fellowship in the A.P.H.A. are hereby advised that Fellowship applications should be received by the Central Office not later than August 1, to insure consideration at the Second Wartime Public Health Conference and 73rd Annual Business Meeting to be held in New York October 3 to 5.

EMPLOYMENT SERVICE

The Association Employment Service seeks to bring to the attention of appointing officers the names of qualified public health personnel and to act as a clearinghouse on employment. This is a service of the Association conducted without expense to the employer or employee.

From the registry of persons available, selected announcements are published from time to time. Appointing officers may obtain lists of all registrants on request.

Address all correspondence to the Employment Service, American Public Health Association, 1790 Broadway, New York 19, N. Y.

POSITIONS AVAILABLE

Wanted: A physician trained in tuberculosis to assume administrative control of the Bureau of Tuberculosis in an eastern city of 200,000 population. Salary $4,500–$5,031 plus cost of living adjustment. Address **Box B**, Employment Service, A.P.H.A.

Hawaiian Territorial Board of Health seeks trained engineer to supervise rodent plague control program. Salary range from $331.67 to $398.33 per month subject to retirement deductions plus bonus. Position under Territorial civil service system with classification of P-4. For further details address A.P.H.A. Employment Service.

Wanted: Physical therapist by Crippled Children's Division. Should be graduate of a school of nursing or of college, with a major in physical education or science; have completed a course in physical therapy; should have had experience in physical therapy, preferably with children. Write for application blank to Merit System Council, 416 Henry Building, 309 S.W. 4th Ave., Portland 4, Ore.

Psychiatric case worker desired for mental hygiene clinic, Department of Health, Peoria, Ill.

Senior Sanitarian, Alaska Health Department. Minimum requirements 2 years college, 6 months public health course, 2 years' experience. Two additional years' experience acceptable instead of each year college. Monthly salary $235–$265. Mary B. Pool, Alaska Merit System, Juneau.

Michigan announces civil service positions now open for orthopedic public health nurse, Grades II and III classes with the Michigan Crippled Children's Commission. Salary range: Grade II $230 to $270 per month; Grade III $280 to $340 per month. Grade II not under 23, Grade III not under 25. Must have completed course in orthopedic nursing or physical therapy in approved school. For Grade III position a full-time course of at least 9 months' duration is required. Must have 3 years' experience in public health nursing, one year of which shall have been in supervisory capacity. For Grade III position one additional year of nursing and one additional year of supervisory experience required. Eligibility for certificate in public health nursing and registration as a nurse in Michigan. For further information write Michigan Civil Service Commission, 310 No. Grand Ave., Lansing 4, Mich.

Wanted: Medical Social Worker for Dept. of Health, Peoria, Ill. Address Director Maternal and Child Health, Dept. of Health, Peoria, Ill.

Wanted: Physician in eastern city of 200,000 population as Director of Bureau of Maternal and Child Hygiene. Salary $4,500–$5,031, plus cost of living adjustment. Address **Box C**, Employment Service, A.P.H.A.

Industrial Hygiene Toxicologist. Calls for person of chemical or chemical engineering background. Position, supervising of chemical work of industrial hygiene service and industrial hygiene laboratory; designing special apparatus for field studies on occupational disease problems; conducting field and laboratory analyses of toxicological exposures in industry; keeping records, interpreting results and preparing records. Requirements, knowledge of chemical laboratory methods and equipment; procedures for qualitative and quantitative analysis of organic and inorganic chemistry; knowledge of chemical methods of determining toxic materials in industry; familiarity with petrographic methods of mineralogical analysis. Immediate temporary appointment will be made, to be followed later by civil service examination to determine permanent status. Salary $2,900 base, plus $100 a year war adjustment, or total of $3,000 per year. Travel ex-

penses also allowed. Must be U. S. citizen. Resident of any state may apply. Write J. Lynn Mahaffey, M.D., Director of Health, State Department of Health, Trenton 7, N. J.

Wanted: Public Health Nurse. Salary $175 per month and full maintenance, plus $25 per month for car expense. Must furnish own car. Write Paul D. Crimm, M.D., Director Boehne Tuberculosis Hospital, Evansville 12, Ind.

City of 70,000, southeastern U. S., seeks qualified health commissioner between the ages of 30 and 45, draft exempt. Salary $4,500 plus auto allowance of $300 per year. **Box V**, Employment Service, A.P.H.A.

Assistant Sanitarian in well established Ohio department of health. Minimum experience 2 years required. Merit system prevails. Salary $1,800–$2,400. Write **Box K**, Employment Service, A.P.H.A.

Wanted: A physician with venereal disease control experience to assume directorship of the Bureau of Venereal Diseases in a large northeastern city. Salary $4,500–$5,000 per year, plus cost of living adjustment and travel allowance. **Box E**, Employment Service, A.P.H.A.

Wanted: Physician (male), American citizen, draft exempt, trained in pediatrics, for a 3 year position as chief resident and research assistant in fine pediatric tuberculosis hospital, New York. Good salary and maintenance. Only one intensely interested in research need apply. Send full details of qualifications and photograph. **Box R**, Employment Service, A.P.H.A.

Wanted: X-ray technician to travel with portable x-ray unit taking chest x-rays at tuberculosis case finding clinics. Includes both industrial and school surveys. Salary $35 per week plus travel and maintenance when away from headquarters. Address **Box M**, Employment Service, A.P.H.A.

Wanted: Resident physician for plant in South America. Must have thorough knowledge of malaria, tropical medicine, and vector control. Must be eligible for licensure in British Colony. Address **Box H**, Employment Service, A.P.H.A.

Tuberculosis Association in large western city seeks a trained and experienced health education director, a director of medical social work, and a public health nurse supervisor. Attractive positions now open in agency with a dynamic program closely related to official groups. Address **Box D**, Employment Service, A.P.H.A.

Physician wanted as Director of Maternal and Child Health in western county health department. Preferably with training in pediatrics and venereology. Some venereal disease control work also. Man preferred but woman considered. Must be in good health. Salary $4,500 per year with car and expenses furnished. Position for duration of war. Address **Box S**, Employment Service, A.P.H.A.

U. S. Indian Service seeks physicians for service in the United States and Alaska. Address Office of Indian Affairs, Health Division, Merchandise Mart, Chicago 54, Ill. Application blanks will be furnished upon request.

St. Louis, Mo., Health Division, Industrial Hygiene Service, seeks two industrial hygienists, either engineers or chemists. Salaries $225 to $250 per month depending on qualifications and experience, plus travel allowances. Address Robert M. Brown, Public Health Engineer, 64 Municipal Courts Bldg., St. Louis 3, Mo.

Wanted: Medical technologists for 550 bed approved California hospital. Give full particulars and state salary desired. Address W. O. Brown, M.D., Kern General Hospital, Bakersfield, Calif.

Wanted: Medical technologist, woman, trained in bacteriology of milk and water, diagnostic cultures, routine blood chemistry and tissue work—paraffin and frozen sections. County position under Civil Service located in the East. Salary to be arranged. Write **Box L**, Employment Service, A.P.H.A.

Wanted: M.D., instructor in preventive medicine and public health, with interest particularly in biostatistics and industrial hygiene. Salary approximately $4,000. Write **Box T**, Employment Service, A.P.H.A.

Public Health Nurses Wanted: Three staff positions available. Generalized program. Annual salary $2,220 to $2,400 plus travel for use of own car. Address Miss Lorilla Britell, Supervisor, King County Health Dept., County-City Building, Seattle 4, Wash.

Health Department of Southern City and County in a rapidly expanding industrial area, population exceeding 200,000, wishes to employ a Director of Division of Preventable Diseases. Salary commensurate with training and experience, $4,100–$4,700 plus allowance for travel. Write **Box P**, Employment Service, A.P.H.A.

Wanted: Bacteriologist or serologist, junior grade, with public health experience preferred, to work in County Laboratory acting in capacity of a State Branch Laboratory. Permanent position, salary $168 per year with advancement if satisfactory. Apply to Dr. R. G. Beachley, Director of Health and Welfare, Arlington County Health Department, 1800 N. Edison St., Arlington, Va.

Nutritionist-dietician. Services of an outstanding nutritionist or dietician desired for research work in food industry. Salary ($5,000–$8,000) dependent on qualifications. Reply should state complete detailed educational background and experience. Apply Box F, Employment Service, A.P.H.A.

Community Health Educator. Wanted a woman, well trained and experienced in modern methods of organizing and conducting health education among neighborhood groups and other adults. Proper personal qualifications essential and would like person having Master's degree. Office with progressive private agency in city, but work chiefly in adjoining suburban and rural areas. Good salary and allowance for automobile expenses. State age, training, positions held, and give references. Address Arthur W. Towne, Secretary, Onondaga Health Association, Loew Building, Syracuse 2, N. Y.

FOR OTHER POSITIONS AVAILABLE WRITE EMPLOYMENT SERVICE, AMERICAN PUBLIC HEALTH ASSOCIATION, 1790 BROADWAY, NEW YORK 19, N. Y.

In view of the current active demand for trained and experienced persons in public health, it is suggested that prospective employers communicate directly with the Employment Service, American Public Health Association, 1790 Broadway, New York 19, N. Y., for up-to-date lists of applicants.

POSITIONS WANTED

ADMINISTRATIVE

Physician, age 37, M.D. Iowa, Dr.P.H. Harvard, specializing in tuberculosis, seeks position as medical director of a sanatorium or a state bureau of tuberculosis. Exempt from military service. **A-476**

Woman physician, experienced in public health education and school health service administration and supervision, seeks full- or part-time position, preferably southeastern New York State. **A-511**

HEALTH EDUCATION

Woman with background of health education and public health nursing, experienced as teacher, supervisor, and writer, seeks teaching position of responsibility. **H-507**

ENGINEER

Well qualified public health engineer seeks responsible position in New York metropolitan area. **E-480**

Sanitary Engineer, C.E. 22 years' experience as sanitary engineer, 14 as director in state health department, now employed. Desires change. Location immaterial. **E-481**

LABORATORY

Research bacteriologist. Unusually trained and experienced woman bacteriologist and serologist now occupying responsible position in state laboratory seeks research work of permanent character. **L-468**

Water chemist, bacteriologist, M.S. degree in Sanitary Chemistry. Age 36, draft exempt. Eight years' experience in state laboratory working on water, milk and sewage. Prefers Midwest or Pacific Northwest location. **L-469**

Research bacteriologist - veterinarian, now in civil service, desires change to direct or indirect war work. P-3 classification. Considerable laboratory and field experience. Used to foreign travel; will go anywhere. Steady hard worker. **L-470**

MISCELLANEOUS

Public Health Nurse. B.S. in nursing, William and Mary College, age 53, seeks position as coördinator of public health nursing, educational director, or director student nurse public health program. Prefers Middle Atlantic States. **M-452**

NEWS FROM THE FIELD

STATE AND TERRITORIAL HEALTH OFFICERS ASSOCIATION OPPOSES FEDERAL COMMISSION FOR INDUSTRIAL SAFETY

At its March meeting, in Washington, the State and Territorial Health Officers Association passed the following resolution:

WHEREAS it appears that a Bill (H.R. 4371) introduced in the House of Representatives under date of March 9, 1944, proposes the extension of services in the Department of Labor by creating therein a Commission for Industrial Safety, and

WHEREAS it further appears that the creation of a Commission for Industrial Safety in the Department of Labor would duplicate activities already provided for in the U. S. Public Health Service for this purpose, and therefore would be wasteful of public moneys, and

WHEREAS furthermore the activities of the proposed Commission for Industrial Safety would tend to interfere with similar services now carried out in various states and state departments, now therefore be it

RESOLVED that the Association of State and Territorial Health Officers hereby declares itself opposed to the Bill in question and reaffirms the opposition which it expressed against Bill H.R. 2800, a similar Bill introduced in the House of Representatives in 1943.

NURSING STUDY PUT ON GRADUATE LEVEL

John S. Gibbs, Jr., President of the hospital board of The Johns Hopkins Hospital, has announced that a baccalaureate degree from an accredited college will be required of all candidates for admission to The Johns Hopkins Hospital School of Nursing, starting with the October term.

He explained that entrance requirements were being raised to meet "the great demand for graduate nurses of superior preparation in the many responsible positions in education and administration, in institutions, in the fields of public health and in other nursing services." The change would also make it easier for the school to map a training program.

The hospital school "will continue its participation in the program of student nurse enrollment fostered by the Government and it is confidently expected will continue to enroll large classes during the war." Of the present 453 students, 373 are members of the United States Cadet Nurse Corps.

BIENNIAL NURSING CONVENTION AND EXPOSITION

The biennial convention of the American Nurses' Association, the National League of Nursing Education, and the National Organization for Public Health Nursing will be held in Buffalo, N. Y., June 5–8. Exhibits as well as principal meetings will be held in the Buffalo Memorial Auditorium, and headquarters are designated as follows: ANA—Hotel Statler, NLNE—Hotel Lafayette, NOPHN—Hotel Buffalo.

NEW YORK OPENS RAPID TREATMENT CENTER AT BELLEVUE HOSPITAL

The Bellevue Hospital Rapid Treatment Center was opened on April 1 in New York City as a war-connected project made possible through the coöperation of the Federal Works Agency and the U. S. Public Health Service with the New York City Department of Hospitals. Among the speakers participating at the dedication were Mayor F. H. LaGuardia, J. R. Heller, Jr., M.D., Assistant Surgeon General, U. S. Public Health Service, in charge of venereal disease control, and Edward M. Bernecker, M.D., Commissioner of Hospitals. Federal Lanham Act funds totaling $575,000 were made available, of which $290,000 were

for construction and the remainder for equipment and maintenance. Federal maintenance is expected to continue for the duration, after which New York City Department of Hospitals will have the benefit of the construction and equipment. For syphilis and treatment will be in general arsenotherapy combined with fever. When and if penicillin is available it will be used. For gonorrhea patients, sulfonamide drugs will be used with fever therapy for those patients who do not respond to the sulfa drugs.

Cornelius T. Stepita, M.D., Surgeon, U.S.P.H.S., has been assigned as administrator of the Treatment Center under the direction of the Medical Superintendent of Bellevue Hospital. One hundred fifty employees including nurses, dietitians, medical social workers, educational and recreational staff, laboratory workers, hospital helpers, clerical staff and maintenance workers are included. Evan W. Thomas, M.D., Chief Syphilologist at Bellevue Hospital, and Alfred Cohn, M.D., in charge of gonococcus research for the Department of Health, will direct the treatment of patients.

An inpatient and an outpatient service at Bellevue will have a 200 bed capacity, and a rehabilitation program will be conducted in buildings of the former convalescent day camp on Welfare Island, with 100 bed capacity. This rehabilitation program will be operated in conjunction with the Board of Education. It will include vocational courses especially aimed at employment in war industries and recreation facilities for patients. After-care supervision will be the responsibility of medical social workers and psychiatric service where necessary will be provided by Bellevue Hospital.

PUBLIC HEALTH IN PUERTO RICO

Under the auspices of the Puerto Rico Public Health Association a recent 2 day meeting was held at San Juan as well as a meeting under the auspices of the public authorities concerned with venereal disease occupying another day.

According to Professor Earle B. Phelps of Columbia University, who has been teaching at the School of Tropical Medicine, there are about 80 students in public health at the school this year in the classifications of health officers, sanitarians, public health nurses, and public health technicians. A group of sanitary inspectors from Haiti took a short course recently. The school is under the direction of Dr. Morales Otero.

DR. STUART MUDD HONORED FOR BLOOD PLASMA WORK

Stuart Mudd, M.D., Professor of Bacteriology at the University of Pennsylvania, has been awarded the annual William Guggenheim honor cup by the University of Pennsylvania Club of New York City. He was selected to receive the award for 1943–1944 " for his outstanding services in his chosen profession, and particularly in the field of blood plasma development with special reference to the system now used by the armed forces of the United States in all battle areas."

SOUTH DAKOTA'S PUBLIC HEALTH PERSONNEL

The recent edition of South Dakota's *Health Highlights* indicates that the following persons are now identified with the State Board of Health at Pierre:

Gilbert Cottam, M.D., Superintendent
Antony Triolo, M.D., M.P.H., Director of Crippled Children and Child and Maternal Health
W. L. Meyer, M.D., Superintendent of State Sanatorium for Tuberculosis
Glen Hopkins, B.S., Acting Director Sanitary Engineering
B. S. Levine, M.S., Ph.D., Director of State Laboratories
Alice Olson. R.N., Director Division of Public Health Nursing

Irvin R. Vaughn, B.A., Director Public Health Education, Assistant Director Vital Statistics
T. A. Evans, M.A., State Milk Specialist
Esther Kempter, Director of Records and Accounts, Personnel Officer
Howard Selvig, M.A., Supervisor Merit System

FLORIDA PUBLIC HEALTH ASSOCIATION

The Florida Public Health Association has elected the following officers to serve for the ensuing year:

President—A. P. Black, Ph.D.
First Vice-President—W. W. Rogers, M.D.
Second Vice-President—Dr. Lucille Marsh
Secretary-Treasurer—E. M. L'Engle, M.D.

PUBLIC HEALTH TRAINING PROGRAMS FOR LATIN AMERICAN GUESTS

A recent report of the Coördinator of Inter-American Affairs indicates that of 215 training programs for Latin American visitors under the auspices of the Coördinator, the following concerned the field of public health:

Biostatistics	2
Blindness prevention	2
Dentistry	7
Health museums	1
Malariology	2
Nursing administration	3
Nutrition	6
Parasitology	1
Public Health	38
Public Health Education	16
Public Health Laboratory	6
Public Health Nursing	10
Quarantine Service	1
Sanitary Engineering	45
Tuberculosis Administration	5
Tuberculosis Research	3
Venereal Disease Control	5
Vital Statistics	1

Dr. Charles E. Shepard of the Division of Health and Sanitation is in charge of the Institute Training Program.

VANDERBILT CONFERS GRADUATE DEGREES IN PUBLIC HEALTH

According to the *Journal of the American Medical Association*, Vanderbilt University recently conferred the degree of Master of Public Health on two candidates, marking the first time in the history of the university that such a degree has been granted. Dr. F. Olason of Iceland and Dr. F. Plotke of Illinois were the recipients of the degrees. Dr. Olason is reported to be a student at the Harvard School of Public Health under a Fellowship from the Commonwealth Fund.

THE NATIONAL NUTRITION FOUNDATION, INC. ANNOUNCES GRANTS OF $130,000 FOR RESEARCH PROJECTS IN NUTRITION

Thirty-three colleges and universities in the United States and Canada will receive renewals of grants for 31 research projects already in progress; and Harvard, Yale, and Cornell will receive funds for new studies.

Dr. C. G. King, Scientific Director of the Foundation, has stated that the most valuable research projects made possible by the Foundation's grants thus far have been " those dealing with army rations, human protein requirements, maternal and infant nutrition, dental caries, and human vitamin requirements."

The new grants are as follows:

Harvard University—for training physicians in the human and public health aspects of nutrition.

Yale University—in support of maternal and infant nutrition studies based on carefully controlled nutrient intakes of primates.

Cornell University—for study of the biochemical mechanism of converting starches and sugar into fat.

A.P.H.A. BOOKS MICROFILMED FOR CHINA

Through the auspices of the American Bureau for Medical Aid to China, volumes on *Standard Methods for the Examination of Dairy Products, Standard Methods for the Examination of Water and Sewage,* and *Diagnostic Procedures and Reagents* have been microfilmed and flown to China for the

use of the National Institute of Health in Chungking.

This project is in addition to the microfilming of current issues of the *American Journal of Public Health* and other publications which are regularly sent to China for the benefit of medical schools and official public health agencies in several parts of free China.

UNIVERSITY OF CALIFORNIA AT BERKELEY OPENS SCHOOL OF PUBLIC HEALTH

President Robert G. Sproul of the University of California, has announced that a School of Public Health has now been established on the Berkeley campus with Walter H. Brown, M.D., Chairman of the Department of Hygiene, as acting dean. The school was set up by the Board of Regents after the State Assembly passed a bill appropriating funds. According to President Sproul, it is an answer to the intensified wartime demand for well trained personnel to fill the depleted staffs of county health offices in California and other western states, which fear a shortage of facilities for meeting serious public health danger.

Planned as a University-wide undertaking using resources of all campuses, the school is being organized as a cooperative enterprise, involving the participation of several other schools and departments, including the fields of medicine, medical research, education, nursing, home economics, and sanitary engineering. The Department of Hygiene will be renamed the Department of Public Health and function as part of the school.

Provision for courses and curricula on both undergraduate and graduate levels is contemplated, and plans will be developed regarding graduate training of health officers, epidemiologists, public health engineers, industrial hygienists, and other specialists.

The first official activity of the school will be a special training course for sanitarians to meet the needs of the State Department of Health in the war emergency.

DR. WILBUR A. SAWYER APPOINTED HEALTH DIRECTOR OF UNRRA

It was announced in Washington on April 25 that Wilbur A. Sawyer, M.D., of New York, N. Y., who for nine years has been the Director of the International Health Division of the Rockefeller Foundation, and who formerly was State Health Officer of California, has been appointed Director of the Health Division of the United Nations Relief and Rehabilitation Administration. Dr. Sawyer is scheduled to retire from the International Health Division next August. James A. Crabtree, M.D., of the U. S. Public Health Service staff, has been acting director of the Health Division of UNRRA.

AMERICAN ASSOCIATION FOR HEALTH, PHYSICAL EDUCATION AND RECREATION

The American Association for Health, Physical Education and Recreation, at its recent 4 day convention in New York City, announced the election of the following officers:

President—William L. Hughes, Columbia University, New York, N. Y.
President-elect—Helen Manley, University City, Mo.
Vice-President of Health Education Division—Dorothy Nyswander, Ph.D., Washington, D. C.
Vice-President of Physical Education Division—Dr. Harry A. Scott, Houston, Tex.
Vice-President of Recreational Division—Carl L. Nordly, University of Minnesota, Minneapolis

PSYCHOSOMATIC MEDICINE FUND

The National Committee for Mental Hygiene, New York, N. Y., has announced the establishment of a fund for research in psychosomatic medicine. According to the announcement, the purpose is to stimulate and to subsidize

research in the psychosomatic aspects of the diseases chiefly responsible for disability and death. The director of the fund will be Dr. Edward Weiss of Philadelphia. Members of the Project Committee include Dr. Charles M. Aldrich, Dr. Franz Alexander, Dr. Stanley Cobb, Lt. Col. William C. Menninger, and Dr. John Romano. The fund will be administered under the direction of Dr. George S. Stevenson, Medical Director of the National Committee for Mental Hygiene, New York, N. Y.

CIVILIAN PENICILLIN QUOTA SET

The War Production Board has recently announced that ten billion units of penicillin can be alloted to civilian use under a plan of distribution through more than 1,000 hospital outlets which have been designated as depots by the WPB.

Although unable to set an exact date, it is anticipated that deliveries would soon begin and the Office of Civilian Penicillin Distribution (OCPD) has been established in Chicago. The March production totals were thirty-five billion units.

SOUTH CAROLINA CONDUCTS WATER WORKS SHORT SCHOOL

The South Carolina Water Works Association and the South Carolina State Board of Health conducted a Water Works Short School at Clemson College, April 10 and 11. More than 50 water plant operators registered for courses and visitors brought up the total attendance to over 75. At a business meeting of the association held in connection with the school, it was voted to change the name of the organization to the South Carolina Water and Sewage Works Association and to revise the Constitution and the general program of the association so that sewage works operators may be included as members.

NEW BILL WOULD ESTABLISH DIVISION OF TUBERCULOSIS CONTROL IN THE U.S.P.H.S.

H. R. 4615 and S. 1851, introduced by Mr. Bulwinkle in the House, and Mr. Thomas in the Senate in April, has been approved by the National Tuberculosis Association and unanimously endorsed by the Conference of State and Territorial Health Officers.

It would establish a Division of Control in the U.S.P.H.S., under the charge of a commissioned officer of the Service detailed by the Surgeon General. It would enable the Surgeon General to make studies, investigations, and demonstrations for more effective prevention, treatment, and control of the disease; to assist, through state health authorities, by grants, states, counties, health districts, and other political sub-divisions of states in establishing and maintaining adequate measures for prevention, treatment, and control, including construction, maintenance and operation, and the training of personnel for state and local health work; and to control the spread of tuberculosis in interstate travel. The Bill authorizes the appropriation of $10,000,000 for the first year, and for thereafter "a sum sufficient to carry out the purposes" of the Act.

The Surgeon General, under the Bill's terms would make allotments to the states on the basis of population, the size of the tuberculosis problem, and financial need. Moneys would be expended by the states in accordance with plans presented by the health authority in each state and approved by the Surgeon General. Grants would be made on condition that state funds would be expended for the same general purpose in an amount to be determined in accordance with regulations prescribed by the Surgeon General, with the approval of the Federal Security Administrator.

The Bill has vigorous support. It is

in the hands of the House Committee on Interstate and Foreign Commerce, and the Senate Committee on Education and Labor. As this is written, hearings before the House Committee are expected to be held at once.

SUMMER POSTGRADUATE STUDY IN PUBLIC HEALTH NURSING

The American Journal of Public Health at the request of the National Nursing Council for War Service is glad to summarize courses which will be available during the coming summer for graduate public health nurses in the hope that health officers and others employing public health nurses may be encouraged to select nurses of outstanding abilities and promise and to make available to them courses of this kind.

Administration of Public Health Nursing, summer courses will be available at the University of Chicago, the University of Michigan, St. Louis University, and George Peabody College for Teachers, Nashville.

Health Education, Loyola University, University of Minnesota, George Peabody College for Teachers.

Industrial Nursing, Loyola University, University of Michigan, New York University, St. Johns University (Brooklyn), George Peabody College for Teachers.

Principles and Practice of Public Health Nursing, University of California at Los Angeles, Catholic University of America in Washington, Loyola University, University of Chicago, Indiana University, Simmons College, University of Michigan, University of Minnesota, St. Louis University, Seton Hall College in Newark, Columbia University, New York University, St. John's University, University of Buffalo, University of Syracuse, Western Reserve University, University of Oregon, Duquesne University in Pittsburgh, George Peabody College for Teachers, Vanderbilt University, Incarnate Word College in San Antonio, University of Washington, Marquette University.

Public Health Nursing Supervision, Catholic University of America, University of Chicago, University of Minnesota, Columbia University, New York University, George Peabody College for Teachers, Incarnate Word College.

School Nursing, University of California, Catholic University of America, Loyola University, Simmons College, University of Michigan, University of Minnesota, Seton Hall College, Columbia University, New York University, University of Buffalo, University of Syracuse, Duquesne University, University of Pittsburgh, George Peabody College for Teachers.

Venereal Disease, University of California at Berkeley, University of California at Los Angeles, University of Michigan, University of Minnesota, St. Louis University, University of Texas.

The University of Minnesota will hold a summer workshop for concentrated short term study in Industrial Health and Community and School Health Education.

MARY SPALDING SCHOLARSHIP FUND

Simmons College announces a scholarship fund for the coming year for the graduate program in Public Health Nutrition. This fund has been contributed by friends of Mary Spalding, formerly Supervisor of Nutrition in the Massachusetts Department of Public Health, who prior to her recent retirement because of illness, made outstanding contributions to the field of public health nutrition.

Application blanks and further information regarding the program, which leads to the degree of Master of Science, may be secured from Dr. Elda Robb, Director of the School of Home Economics, Simmons College, The Fenway, Boston, Mass.

SYNTHESIS OF QUININE CLAIMED AS ACHIEVEMENT

The newspapers and radio on May 3 carried an announcement that the total synthesis of quinine had now been achieved after almost a hundred years of effort to build up this alkaloid.

Crediting Robert B. Woodward and William E. Doering, two 27 year old chemists at Harvard, with the discovery, the announcement was made by the Polaroid Corporation and released through censorship channels. According to this announcement, these workers within 14 months were able to synthesize a produce "which is an exact duplicate of natural quinine and which cannot be distinguished from it any way." It is said to be completely unlike atabrine and plasmochin.

According to the announcement, the process produces quinotoxine out of coal tar, but there is some doubt in the minds of the investigators whether their method can produce the drug in commercial quantities at the present time.

INSTITUTE OF HYGIENE OPENS IN HAVANA

The Institute of Hygiene, in Havana, Cuba, of which Dr. Moises Chediak is Director, was formally opened in new quarters on May 15. The American Public Health Association was represented by Dr. R. E. Dyer of the U. S. Public Health Service, Director of the National Institute of Health, who was a guest of the Cuban Government and who expressed greetings on behalf of the Association to the friends of the Institute.

Dr. Alberto Recio, the Minister of Health of Cuba, announces that the Institute which is now housed in the new buildings recently occupied by the headquarters of police, will have three divisions, namely, a division concerned with clinical diagnostic procedures, including parasitology, hematology, serology, and bacteriology; a division concerned with sanitary, chemical, and physical examinations of water, sewage, swimming pools, food, and drugs; and a division for the manufacture of vaccines, plasma, sera, etc., to supply the public hospitals and dispensaries of Cuba. Close relationships will be developed with the Hospital for Infectious Diseases.

The Institute will have a staff of 150 persons, including 10 physicians and at least one sanitary engineer. It is under the direction of a board of 7 trustees appointed by the President. According to Dr. Chediak, the Institute, which until two years ago was a part of the Finlay Institute, will carry on the above functions, leaving to the Finlay Institute the functions of teaching and research.

FLORENCE PHENIX JOINS CHILDREN'S BUREAU

The Children's Bureau announces the appointment of Florence Phenix to the Nursing Unit, Division of Health Services of the Children's Bureau, as special consultant nurse in Crippled Children's Services. Miss Phenix was associated for a number of years with the Crippled Children's Division of the Bureau for Handicapped Children, Wisconsin State Department of Public Instruction, and more recently with the New York City Department of Health.

In her new position she will act as special consultant to state agencies in orthopedic nursing and physical therapy as arranged by the regional offices of the Division of Health Services of the Children's Bureau.

FELLOWSHIPS IN HEALTH EDUCATION OFFERED BY THE U. S. PUBLIC HEALTH SERVICE

Fellowships for graduate study and experience in health education will be offered to qualified women this fall by the U. S. Public Health Service through

funds made available by the W. K. Kellogg Foundation. They will lead to a Master of Science degree in Public Health.

The fellowships will provide 12 months' training in public health education with 9 months devoted to academic work in public health and public health education, and 3 months to supervised field experience. A stipend of $100 a month for 12 months, full tuition and travel for field experience is included.

Only women will be considered for fellowships at this time. Women who are citizens of the United States between the ages of 19 and 40 years, inclusive, who possess a Bachelor of Science degree, or its equivalent, from a recognized college or university may apply.

The announcement of the fellowships from the U. S. Public Health Service states that

> . . . the demand for qualified health educators in the past few years has increased to such an extent that at present there are not enough trained personnel to meet existing openings. Expanding fields are opening to the health educator through the local, state, and federal health departments, schools, and voluntary agency programs of community and school health education. Leading public health authorities have recommended that a health educator be added to every local health department in the country, and the need for health education personnel abroad is foreseen.

Forms for application for fellowships may be obtained from the Surgeon General, U. S. Public Health Service, Washington 14, D. C. Applications must be accompanied by a transcript of college credits and a small photograph and must be in the office of the Surgeon General not later than August 1, 1944.

DR. CUMMING ELECTED PRESIDENT OF THE PAN AMERICAN UNION

Dr. Hugh S. Cumming, Director of the Pan American Sanitary Bureau, has been elected President of the Pan American Conference of National Directors of Health, at the Fifth Conference held in Washington in April. Other officers elected are: Dr. Aristides A. Moll, Secretary General; Dr. Manuel Martinez Baez of Mexico; Dr. Eugenio Suarez of Chile; Dr. Cesar Gordillo Zuleta of Peru; and Dr. Leopoldo Izquieta Perez of Ecuador, Vice-Presidents.

NEW YORK STATE HEALTH DEPARTMENT WINS NATIONAL SAFETY AWARD

"Four Point Safety Home," the latest motion picture film of the New York State Health Department has received the award of the Film Safety Awards Committee of the National Safety Council for "the best home safety nontheatrical film" of 1943. The award was presented on April 12 at a meeting of the Western New York Safety Conference in Buffalo. The award, a model "Oscar," was accepted for the department by Dr. Paul B. Brooks, Deputy Commissioner, on behalf of Dr. Edward S. Godfrey, Jr., Commissioner. Also present at the ceremony were Burt R. Rickards, Director of the department's Division of Public Health Education, and Thomas C. Stowell, Assistant Director, under whose supervision the film was produced.

SUPREME COURT OF CALIFORNIA UPHOLDS DECISION IN FAVOR OF HEALTH DEPARTMENT

The outcome of a case in California involving the Natural Milk Producers Association and the City and County of San Francisco is of interest to health officials. The case has been in process for more than two years. The Supreme Court of California upheld the San Francisco ordinance requiring the pasteurization of all milk sold in the City and County of San Francisco on the grounds that such was not

contrary to the sections of the Agricultural Code but merely imposed additional restrictions and higher standards than those required by the state law. Following that decision the plaintiff took the case to the Supreme Court of the United States, which court determined that there were no federal questions involved and hence referred the case back to the Supreme Court of California for such further proceedings as the latter might deem appropriate. The Supreme Court of the state reaffirmed and adopted its original opinion.

This information comes from Dr. J. C. Geiger, Director of Public Health, City and County of San Francisco.

HENRY STREET SERVICE APPOINTS NEW DIRECTOR

The Board of Directors of the Henry Street Visiting Nurse Service have announced the appointment of Marian G. Randall, R.N., as Director effective June 1. Elizabeth C. Phillips, R.N., who has been Acting Director, resumes her former position as Assistant Director.

Miss Randall served as Assistant Director of the Henry Street Visiting Nurse Service in charge of records and statistics, from 1938 to 1941, when she left to take a wartime position as principal nursing consultant in the U. S. Public Health Service, assigned to the Medical Division of the U. S. Office of Civilian Defense, Washington, D. C. Since completion of this assignment, she has been making a study of prepayment plans for nursing service for the Associated Hospital Service of New York.

She is Secretary of the Public Health Nursing Section of the American Public Health Association.

REPORT ON FILM EQUIPMENT SURVEY

Film planning can be done much more effectively when agencies which make films have at least a broad picture of the type of film-showing equipment available among the groups they wish to reach. The value of such information has been demonstrated by the recent Department of Commerce studies of visual aid equipment on hand in elementary and high schools. Figures on equipment available in another group—this time community agencies—are now released as the result of a survey made by the Metropolitan Life Insurance Company.

The Motion Picture Bureau of the company's Welfare Division, under the direction of Dr. Donald B. Armstrong, sent a questionnaire to social, health, and safety agencies all over the country to find out how many agencies had access to or owned equipment for showing films. These agencies were also asked to indicate what type of equipment they had—sound or silent, 35mm. or 16 mm., film strip or glass slide projectors. The organizations surveyed cover a wide range, including among others urban and rural health departments, various nursing organizations, family welfare associations, boys' clubs, schools of medicine, nursing, and social work, safety councils, and tuberculosis associations.

Replies came from more than half of the 5,000 organizations that received the questionnaire. More agencies report having 16mm. projectors, both sound and silent, than any other equipment. Schools of medicine and nursing own most of the glass slide projectors. As might be expected, boys' clubs favored sound equipment 2 to 1.

An analysis of the returns shows other facts which may be of interest to social and health agencies. Full details of the results of this survey may be had for the asking by any official or voluntary social, health, or safety agency that may find them useful. The Metropolitan Motion Picture Bureau

will furnish information regarding the entire survey, or as broken down by localities or types of organizations in accordance with the request.

In addition to this information, the Motion Picture Bureau has a library of catalogs of motion pictures and film strips available through universities, museums, safety councils, federal and state government departments, industries, etc., covering many subjects. The bureau will suggest sources of films on particular subjects to agencies requesting them. For any information on this survey of film equipment, the company's own films, or films available through other sources, write to: Dr. D. B. Armstrong, Third Vice-President, Welfare Division, Metropolitan Life Insurance Company, 1 Madison Avenue, New York 10, N. Y.

PERSONALS

Central States

JOSEPH HOWARD BEARD, JR., M.D.,* Urbana, Ill., has been lent by the U. S. Public Health Service to become Health Officer of Wilkinson County, Woodville, Miss., to succeed ROBERT M. WINGARD, M.D.†

DANIEL W. MEAD,* who is Emeritus Professor of Hydraulic and Sanitary Engineering at the University of Wisconsin, has been elected an honorary member of the Canadian Institute of Engineers. Mr. Mead became a member of the American Public Health Association in 1892 and a Fellow in 1922 and is the recipient of the 40 year certificate of membership.

F. A. MUSACCHIO, M.D., M.S.P.H.,† formerly Director of the St. Joseph County (Michigan) Health Department, has accepted the directorship of the Laredo-Webb County Health Unit, Laredo, Tex.

EMILY L. RIPKA-HAUTA, M.D., M.P.H.,† Roscommon, Mich., has been appointed Health Officer of Midland County to succeed RALPH R. SACHS, M.D., M.P.H.†

Eastern States

THOMAS R. CAMP,* Boston, Mass., has resigned from the faculty of the Massachusetts Institute of Technology, where for 15 years he has been in charge of sanitary engineering, to engage in full-time practice as a consulting engineer with offices in Boston. He will specialize in water works, sewage works, municipal and industrial waters, stream sanitation, and flood control. Mr. Camp is a graduate of Texas A. & M. College and received a Master's degree from M.I.T. in 1925.

KATHARINE FAVILLE, R.N.,* recently Director of the Henry Street Visiting Nurse Service, New York, N. Y., has accepted a position as Director of the Department of Nursing at Wayne University, Detroit, Mich. Miss Faville will be in charge of the 4 year basic program in nursing education as well as the program of graduate study for public health nurses and instructors in schools of nursing.

Southern States

HUGH S. CUMMING, M.D.,* Surgeon General (R), U. S. Public Health Service, was elected President at the Fifth Pan American Conference of National Directors of Health held in Washington, D. C., April 22. Dr. Cumming is Director of the Sanitary Bureau of the Pan American Union.

E. V. MCCOLLUM,* Professor of Biochemistry at the School of Hygiene and Public Health, Johns Hopkins

* Fellow A.P.H.A.
† Member A.P.H.A.

University, Baltimore, Md., has been elected a foreign member of the Swedish Academy of Sciences. Dr. McCollum has also been announced as the first recipient of the Borden Nutrition Award given by the American Institute of Nutrition "in recognition of his long years of pioneering research in nutrition. His contributions to our knowledge of the Vitamin content of milk and of the high nutritive value of protective foods, have served as foundation stones for improving through food the nutrition and health of the human race."

THOMAS F. MCGOUGH, JR., M.D.,† Health Officer of Pulaski-Wythe Health District, Pulaski, Va., resigned effective January 16 to enter military service.

ROE E. REMINGTON, PH.D.,* has resigned as Professor of Nutrition and Director of the Food Research Laboratory of the Medical College of the State of South Carolina, a post which he has held since 1928, as reported by *Science*.

THOMAS SCARLETT, M.D.,† Health Officer of Harrisonburg, Va., resigned, effective February 12, to enter military service

HAROLD W. SEFF, M.D., of Chattanooga, Tenn., has accepted the position of Health Commissioner of the Delaware City and County Board of Health, Delaware, Ohio.

DANIEL C. STEELSMITH, M.D., Health Officer of Halifax-Pittsylvania Health District, South Boston, Va., has resigned effective April 1.

BEN F. WYMAN, M.D.,† has been appointed as State Health Officer effective May 1, according to an announcement made by The Honorable Olin D. Johnston, Governor of South Carolina. Dr. Wyman has been Director of Rural Sanitation and County Health Work in the same department since 1926.

Western States

CHARLES R. BLAKE, JR., B.A.,† on account of ill health, has resigned as Health Officer of Richmond, Calif.

EDWIN N. HESBACHER, M.D.,† Assistant Surgeon, U. S. Public Health Service, has been appointed Director of Venereal Disease Control of the Seattle Health Department, Seattle, Wash. He succeeds BURTON L. ZINNAMON, M.D., who has been transferred to Oakland, Calif.

EMIL E. PALMQUIST, M.D.,† M.S.P.H., who for several years has been Health Officer of the Olympic Health District, Washington, including Clallam and Jefferson Counties, has resigned to become Health Officer of the King County Department of Health, Washington, including the county area outside of Seattle.

MARTHA SHAMBERGER, M.P.H.,† has been appointed Health Education Representative with the Washington State Department of Health, Seattle, Wash. Miss Shamberger was recently associated with the Oregon Tuberculosis Association, Portland, Ore.

Foreign

WILLIAM H. ADOLPH, PH.D., has been appointed acting professor of chemistry and nutrition at the School of Nutrition of Cornell University, Ithaca, N. Y. Dr. Adolph for several years has been Chairman of the Department of Chemistry at Yenching University, Peking, China.

Deaths

CARLOS EDUARDO FINLAY SHINE, M.D.,* former Secretary of Health and Professor of Medicine of the University of Havana, Havana, Cuba, died March 11 at the age of 76. The son of Carlos J. Finlay, pioneer

* Fellow A.P.H.A.
† Member A.P.H.A.

American Journal of Public Health
and THE NATION'S HEALTH

Volume 34 July, 1944 Number 7

International Vital Statistics of the Future*

FORREST E. LINDER, PH.D.

Assistant Chief, Division of Vital Statistics, Bureau of the Census, Washington, D. C.

PERHAPS most of the statistical analysts here can recall their first experience in making a comparative vital statistics study for various countries of the world. After a few days of hard work in the library it was soon discovered that it is very difficult if not impossible to make satisfactory world-wide vital statistics studies. Data for even some of the large countries are not available; there is a wide variety of methods of compilation and classification; and there exist no general standards for completeness and accuracy.

Confronted with such a situation, the analyst is likely to give some thought to the problems of collecting and compiling vital statistics so that international studies would be possible. Obviously, progress toward the desirable goal of world-comparable vital statistics depends upon a clarification of the responsibilities and interests of the numerous governmental units which contribute to the production of those statistics. In the United States, the city, the county, the state, and the federal government each has an essential and a distinctive responsibility in the United States vital statistics collecting organization; and, in turn, each has its own distinctive uses and needs for the records and data it has helped to collect. A similar pattern will be found in other countries. And beyond the scope of national government, those official and private organizations concerned with international problems of health or health statistics have a contribution to make to, and a real interest in, hemisphere or world vital statistics.

The fact that each unit in the governmental hierarchy, from the smallest town to the most global world organization, has an interest in vital statistics is no indication that these interests are the same. The smaller units of government need and can produce intensive and detailed analyses of local data. The work of each larger governmental unit becomes successively more *extensive* and correspondingly less *intensive*. No

* Presented before the Vital Statistics Section of the American Public Health Association at the Seventy-second Annual Meeting in New York, N. Y., October 13, 1943.

state vital statistics office could hope to duplicate the type of intensive demographic studies which can be made in a progressive city office. In such a local office, data can be tabulated on a tract basis and studied in relation to other tract data with a direct knowledge of pertinent local conditions. The data can be tabulated week by week or day by day, and if necessary, cases can be individually listed for exhaustive special investigation. The state office has the opportunity for more extensive analyses based on consolidated data for the whole state or upon the comparison of areas within the state. But to the degree that the state totals are a consolidation of heterogeneous data or that the comparisons involve noncomparable areas, the possibility of detailed study is lost. Similarly the work of our national agencies, based on interstate comparisons or on consolidated data for 48 states, loses in detail and validity as much as it gains in scope and generality. In the international field the extensity of interest is so great and the data under consideration are so heterogeneous that it is difficult to make even the vaguest conclusion or the most general comparison.

Although the contributions and requirements of each unit in the vital statistics organization are different, they are by no means independent. The vital statistician for any city can analyze his material on an *internal* basis, taking into consideration differences and facts within his area. However, much would be added to the value of his analysis if it were also studied on an *external* basis by making comparisons between his city and others. The vital statistics for the whole United States are of more value when viewed against a background of international vital statistics, and if there are men on Mars, I assume that the global statisticians will some day be making interplanetary comparisons.

The interest of the statistician for one area in the vital statistics of other areas is not due to the need of data for external comparisons only. A factor of greater importance is the interdependence of the various areas of the country with regard to health conditions. Health conditions in your own city, state, or country which result in unfavorable mortality would be of importance to you. Similar health conditions in an adjacent area might be of equal interest if there was a danger of them spreading. A health official in Maine might well be concerned with the vital statistics of a potential epidemic in California. In these days of rapid world transportation, the United States must become more and more concerned with the vital statistics of the other nations of the globe with whom we maintain social and economic relations. Like wars, epidemics have no respect for political boundaries.

This dual dependence of the medical statistician in one area upon the data produced by a statistician in another area is a strong unifying force which has advanced vital statistics further along the road to world comparability than any other statistical field. In effect, it means that the statistician in any unit of the system has a real and legitimate interest in the methods, procedures, and programs of every other unit. Each unit within a state has an interest in the work of the state vital statistics office because the activities of that office affect the type of external statistics which a city or county may be able to get. Each state statistician has a legitimate concern and responsibility wth the problems of national collection because the actions or recommendations of a national agency may facilitate or hinder the essential external studies made by the various states. Each national government has a responsibility to partake in and contribute to those international activities

which have world comparability as their ultimate goal.

When every governmental unit contributes to and in turn is dependent upon a vital statistics system, is it too much to hope that ultimately we shall have an integrated and coördinated world vital statistics system?—and that then, the elusive goal of "comparability" will become somewhat more of a reality?

Such a concept of a world vital statistics system carries with it no necessary implication of a super world government. More, perhaps, can be attained by the coöperative efforts of the independent countries working together with some international coördinating agency. Much more can be accomplished by such methods than is ordinarily realized. Take a single example from our own voluntary system of federal-state vital statistics. Make this simple test: On a table, spread out copies of the death certificates in use by each of the independent state and city death registration units. Then, spread out the records for some other state activity—such as marriage certificates, or licenses for automobile drivers. Among the death certificates you will note a surprisingly high degree of uniformity and comparability. Among the other records, you will almost certainly find a great variation.

The state-to-state uniformity of the death records is the result of no mandatory national law but is rather one of the many results of 40 years of continuous coöperative effort between national, state, and city officials—each realizing his responsibility in and his need for a coördinated organization.

Already substantial progress has been made in the field of international comparability of vital statistics. The almost universal use of the *International List of Causes of Death* represents an achievement that has no counterpart in any other statistical field. Widespread recognition of the need for better international vital statistics is opening the door for further progress. The Eighth American Scientific Congress, the Fourth Pan American Conference of National Directors of Health, the XI Pan American Sanitary Conference, the First Pan American Conference on Social Security are some of the inter-American conferences of recent years which have adopted specific resolutions and recommendations calling for an improvement in national and international vital statistics. In the Western Hemisphere several inter-American agencies are taking active steps to assist in coördinating and stimulating efforts for the development of vital statistics among the American Republics. The Pan American Sanitary Bureau and the Inter American Statistical Institute are both actively interested in improving sources and comparability of demographic data.

The inter-American program of the Vital Statistics Division of the Bureau of the Census can be considered as one small contribution to the solution of the problems of international vital statistics. This program has four interrelated parts. The first part involves the lending of technical consultants to other American Republics that request such assistance for the reorganization or improvement of their vital statistics methods. Under this program one Census Bureau field consultant is working in the Caribbean Area and another is in Central America. Several additional projects are now being formulated for South America.

A second part of the program involves offering fellowships to South American vital statisticians who wish to study in this country. This part of the program is not yet under way, but it will probably be started on a small scale this year. In addition to its own fellowship program, the Bureau is coöperating with other governmental

and non-governmental agencies by offering some training in the administrative aspects of vital statistics to students brought to the United States by those other agencies.

The third part of the Census Bureau program is a systematic compilation from published sources of vital statistics data for each of the American Republics. Such compilations have been completed for 3 countries and during the course of the next 12 months, demographic compilations will be undertaken for 17 others. These compilations will ultimately form the foundation for a comprehensive study and analysis of the demographic and public health problems of the Western Hemisphere.

The fourth aspect of the Census Bureau program is an effort to improve and standardize vital statistics methods by the preparation and distribution of those "tools" which a vital statistician needs in his work. An elementary manual on vital statistics has been prepared, translated into Spanish, and published by the Ministerio de Salud Pública of the Republic of Uruguay. This *Manual de Estadística Vital* has been reprinted and given wide distribution by the Census Bureau. It is also being reprinted in the official statistical journal of one South American country and is being translated into Portuguese for publication in the official statistical journal of Brazil. In order to provide a tool for the conversion of technical matter from one language to another, the Bureau has prepared and distributed a *Vocabulario Bio-estadístico* which gives Spanish-English equivalents of some 1,600 common terms used in vital statistics. Plans are also being made for the preparation of a Spanish edition of the index of the *International List of Causes of Death* and the conversion of other "work tools" of the statistician to a bilingual or multilingual basis.

There is no mistaken optimism that this program will quickly solve the problems of inter-American comparability and that we may now expectantly look forward to the immediate availability of adequate medical statistics for the American Republics. The goals are difficult and far from attainment.

There is little agreement of opinion even within our own country regarding the ideal goals of a vital statistics system and the proper methods of attaining those goals. Before much can be accomplished in the international field these objectives must be more clearly formulated and the prerequisites and methods for the system must be more adequately explored. In addition, some fundamental problems of organization must be solved. The most optimistic sign is the general recognition of the fact that although the needs of different units of the statistical system are distinct, their interests are interdependent. Substantial progress from now on will require the coöperative work of local, state, national, and international vital statisticians.

Army Field Water Supply Developments*

HAYSE H. BLACK, C.E.

Captain, Corps of Engineers, Chief, Water Supply Equipment Branch, The Engineer Board, Fort Belvoir, Va.

THERE are few items of Army supply more important than potable water. Production of potable water in adequate quantities for field troops is just one of the many and varied military assignments of the Corps of Engineers. Global mechanized warfare has introduced innumerable water supply and water treatment problems heretofore not conceived. The purpose of this paper is to cite some of the more important water supply developments resulting from American participation in World War II.

Some conception of the problems confronting the Corps of Engineers may be realized from consideration of the fact that provision must be made for supplying potable water to the individual soldier, whether he be a part of a small detachment on an isolated island or a member of an organization making up a field army. The water supply problems of task forces are frequently more complicated than those presented by larger troop movements. The widespread dispersion of American forces has recently been discussed by General George C. Marshall, Chief of Staff of the U. S. Army, in his biennial report to the Secretary of War, where he reported that American troops were stationed in 51 different places around the world. This is indicative of the potential water supply problems.

The field army will be forced to utilize such sources as sea water, grossly polluted streams, and brackish well waters in addition to more acceptable ones. These conditions make it imperative that equipment and processes be available to permit the accomplishment of military missions, and Army water supply processes and equipment are designed to meet the highly variable field conditions anticipated.

ORGANIZATION, FACILITIES AND EQUIPMENT

The Engineer Board is the development agency for the Corps of Engineers, operating under the general direction of the Engineering Division, Office, Chief of Engineers, U. S. Army. The Water Supply Branch of the Engineer Board is charged with the conduct of research and development pertaining to water supply for the Army.

The main offices of the Engineer Board are located at Fort Belvoir, Virginia, where administrative functions, research, and a substantial portion of the development are conducted. Field parties are established in areas where the environment is conducive to special testing. The Water Supply Branch maintains two extensive field sections

* Presented before the Engineering Section of the American Public Health Association at the Seventy-second Annual Meeting in New York, N. Y., October 13, 1943.



FIGURE 1—Water Supply Branch Laboratory, Equipment Test Room

for testing and development of water supply equipment. Well equipped shops and field offices are provided for these sections for maintaining and servicing units under test.

The Water Supply Branch Laboratory, recently completed, was designed for its special tasks. This modern laboratory is equipped for chemical and bacteriological analytical work, water purification and hydraulic studies, and physical testing of water supply mechanical equipment. A spectrograph, complete with comparator-densitometer, is provided for qualitative and quantitative chemical analyses. Abundant space is available for pilot plant and full scale studies. Equipment being developed is subjected to full scale testing prior to being recommended to the Chief of Engineers for adoption. A view of a portion of the laboratory is shown in Figure 1.

WATER PURIFICATION

Recent desert warfare focused attention on water distribution when its scarcity necessitated transporting it long distances. This is an abnormal military function and every effort is made to reduce the length of haul for water to an absolute minimum. This means that in those areas where water is available, it is expected that such treatment as is necessary will be employed to produce a satisfactory and safe drinking water. Satisfactory accomplishment of water purification under all field conditions is a foregone conclusion to the American soldier who in civilian life was accustomed to uninterrupted water service.

Although basic principles of water purification are well established, the adaptation of them to field Army requirements presents many problems which do not normally concern water

works men. Full cognizance is taken of the fact that proven design factors and operation procedures for water purification in fixed installations may be relied upon to produce a safe treated water. These same principles, however, when applied to portable equipment, frequently introduce complications. It will be appreciated that the multiplicity of Army field water supply problems invite and occasionally result in deviations from standard water works practice.

Current standard mobile and portable water purification equipment tends toward excessive filtration rates and inadequate pretreatment of the water to be filtered. This is a natural consequence of an attempt to produce the maximum amount of potable water with a minimum of equipment and supplies. The efficiency of this field equipment has been studied in collaboration with the National Institute of Health, U. S. Public Health Service, in order to determine its limitations and to establish optimum operating procedures. Improved results are attainable through reduced filtration rates and provisions for intermediate coagulation and sedimentation. Although these modifications result in an improved filtered water, treatment with germicidal agents continues to be an extremely important step in producing a potable water.

Novel water problems appear in foreign areas. Schistosomiasis, which is virtually unknown in the United States, is endemic in many tropical and subtropical countries. The disease is caused by cercariae, which enter the body through the skin and thus become a bathing as well as a drinking water problem. Due to the resistance of the cercariae to chlorine and their ability to penetrate sand filters, it becomes necessary to resort to longer storage, higher chlorine residuals or improved filtration when these organisms are present in the raw water. Present practice favors chlorine rather than chloramine as a cercaricide but their relative efficiency is still in doubt and is to be investigated.

Manufacture and distribution of water purification chemicals in wartime present new and unusual problems. Demand for chemicals frequently prohibits normal refinement in the finished product, necessitating tolerance of impurities not commonly accepted. New processes have been developed for manufacture of coagulants, giving products which will contribute to postwar water treatment. As a result of these developments, satisfactory water purification chemicals have been made available in quantities to satisfy Army requirements.

Studies of calcium hypochlorite have shown a definite correlation between moisture content and container corrosion. High moisture (10 to 20 per cent) calcium hypochlorite has been found to cause failure of metal containers in one year's storage. An interesting observation in this study has been the stability of this product. Calcium hypochlorite, in corroded containers allowing exposure to the atmosphere, still retains approximately 75 per cent of its original available chlorine content. However, there is ample justification for specifying a low moisture product; that is 2 per cent moisture or less.

Facilities have been made available for sterilization of large quantities of either filtered or untreated water. Commercial equipment has been incorporated into a protective framework, along with solution reservoir, water meter, water line connection and diffusor tube. The apparatus applies sterilizing agent in direct proportion to the main line flow, being operated by water under pressure from the supply. This equipment is flexible, and by improvising it can be made to

treat water over a wide flow range. This particular equipment is well adapted for treatment of municipal water supplies in occupied areas.

DIATOMACEOUS SILICA FILTRATION

Research has been directed toward effective, lightweight, portable water filtration equipment. Diatomaceous silica has been intensively investigated by the Engineer Board during the past six months as a possible filter medium to replace sand now being used in Army water filtration equipment. The excellent results obtained from these studies indicate that diatomaceous silica filtration is superior to sand filtration for portable water purification equipment.

Inasmuch as diatomaceous silica is a relatively new medium for water filtration, the following description should be helpful in understanding this application. Diatomaceous silica is the refined product obtained from sedimentary diatomite, the deposits of fossil valves or shells of diatoms. The diatom, a single-celled marine plant, which is related to algae, secretes a siliceous frustule consisting of two valves which inclose the entire shell. Deposits of diatomaceous silica (the unrefined product is commonly known as diatomaceous earth or Kieselguhr) were formed in shallow water during the Miocene period and subsequently raised above sea level to form deposits along the Pacific coast in this country. Diatomite is mined in open pits, crushed, classified, and treated to produce a variety of commercial filter-aids that have been used for a number of years by the process industries in the clarification of sugars, chemicals, oils, fruit juices, varnish, and other liquids. The principal component parts of the diatomaceous silica filter are the diatomaceous silica itself and a rigid support, hereafter referred to as filter membrane, upon which the filter medium forms as a porous filter cake. Extensive tests have been conducted with different types of filter membranes such as those constructed of aluminum oxide, carbon, and Monel wire. Rigid, porous filter tubes made of aluminum oxide or carbon and wire-wound fluted cores appear to be superior to other types of filter membranes tested.

The diatomite filter is placed in operation by applying an initial layer of filter-aid known as "precoat," which is formed by pumping a suspension of diatomaceous silica (0.1 to 0.15 lb. per sq. ft. of filter surface) through the filter membrane at the rate of 2 to 4 gal. per sq. ft. per minute. The water containing this suspension is circulated until the material is deposited and until the filtered water is free from turbidity. Enough water, preferably filtered, to fill the system is used in mixing the diatomaceous silica suspension. Flow through the filter membrane is inversely proportional to the resistance, causing a coat of uniform thickness to form.

Inhibition of an impervious "schmutzdecke" is accomplished by continuous addition of the diatomaceous silica to the water being filtered. The diatomaceous silica added during the filter run is termed "body-feed." The body-feed combines with the suspended materials to form a cake that remains porous, permitting extended filter runs at reasonable pressures. The amount of body-feed required varies with the amount and nature of the suspended matter in the water. Tests indicate that the ratio of filter-aid to turbidity by weight is approximately 1.25 to 1 for inorganic silt and 3 to 1 for organic slimes. Body-feeding has been accomplished by utilizing pressure differentials such as that produced by pump suction or a Venturi throat, but it is believed that positive and proportional mechanical feeding is preferable.

The filter cake is readily removed by reversing the flow through the filter membrane. Normally, the filter is

allowed to drain, after which approximately 10 gal. of filtered water per sq. ft. of filter surface is pumped in reverse through the filter membrane at a rate of 7 to 10 gal. per sq. ft. per minute. The filter cake may be easily removed by air in lieu of backwash water.

Tests conducted in collaboration with the National Institute of Health, U. S. Public Health Service, have shown that diatomaceous silica filtration will effect complete removal of the cysts of *Endamoeba histolytica*. NRS strain cysts were used in this research. This type filtration has likewise been proved to be highly effective in removal of bacteria. Rapid sand filtration, at rates in excess of the accepted standard, was proved ineffective in removal of the NRS strain cysts of *Endamoeba histolytica*. Special tests were conducted with intermittent flow and vibration of the diatomaceous silica filter unit to simulate adverse operating field conditions with the result that no cysts appeared in the filtered water from correctly designed units. The results of these tests demonstrated that diatomaceous silica will accomplish complete removal of *Endamoeba histolytica* cysts irrespective of the nature of the raw water or the concentration of the cysts at flow rates as high as 7 gal. per sq. ft. per minute.

Removal of turbidity with diatomaceous silica filtration is essentially complete. Suspensions of extremely fine clay or algae have been readily filtered, producing a filtered water that gives no tyndall effect when a strong beam of light is passed through the water in a darkened room. This corresponds to a turbidity of absolute zero on any turbidimeter in use, a turbidity of 1.0 p.p.m. on the St. Louis turbidimeter, giving a solid cone of reflection in the light beam. Tests indicate that the removal of microorganisms may be highly effective. Since a close correlation between the amount of turbidity and the number of microörganisms was found in all tests, water producing no tyndall effect may approach sterility. Activated carbon introduced with body-feed has been used to remove tastes, odors, and color.

The quality of the filtrate appears, within limits, to be independent of the flow rate for a given filter-aid. This characteristic of diatomaceous silica filtration permits relatively high filtration rates as compared with sand filtration. The clarity of the filtrate produced with proper grades of filter-aid is striking. Turbidities ranging from 0 to 0.3 p.p.m. on the St. Louis turbidimeter or tyndall effect instruments have been consistently attained. Particle size for diatomaceous silica ranges from 0.5 to 12.0 microns, whereas filter sand may vary from 300 to 600 μ. Considering the particle size, the mechanical straining action may be expected to be much more effective with diatomaceous silica than with sand and with relatively thin layers of this material. Furthermore, the indented diatom valves may be expected to perform more efficiently than relatively smooth grains of sand in removing particles by adhesion. Tests have shown that the use of minute amounts of coagulants with filter-aid will produce a filtrate that gives no tyndall effect with a strong beam of light.

Average flow rates have been steadily increased as a result of this research from approximately 2.5 to 6.0 gal. per sq. ft. per minute when filtering water containing 200 p.p.m. of alluvial clay. Higher flow rates are in prospect with treated filter-aids and using higher capacity, higher pressure pumps. The military value of diatomaceous silica, as a filter medium, becomes most apparent when it is realized that the precoat requires only 0.1 to 0.15 lb. of material per sq. ft., whereas the conventional sand filter requires approximately

200 lb. of sand to give 1 sq. ft. of filter surface.

Since effective coagulation and sedimentation are not required with diatomaceous silica filtration, operation becomes independent of chemical constituents in the raw water when treated filter-aids are used. Filtration operations are accordingly simplified. Water of high turbidities may be filtered at high rates by increasing body-feed, producing the same quality of filtered water as obtained from low turbidity sources.

Advantages of diatomaceous silica over other recognized filter media for water may be summarized as follows:

1. Higher output per unit weight
2. Improved quality of filtered water
3. Simplified operation

Cognizance is taken of the fact that diatomaceous silica filtration of water must prove its worth to the water works profession. It is further realized that there are still many unknowns in the study of diatomaceous silica filtration. Results of studies conducted by the Engineer Board indicate that diatomaceous silica approaches an ideal filtering medium for use in portable water filtration equipment and that its potentialities should attract the interest of research workers in the water works profession.

GROUND WATER DEVELOPMENT

There are large areas in the world likely to be occupied by American troops where dependence must be placed upon ground water. This situation has necessitated providing equipment to locate and produce ground water under a great variety of conditions. In undertaking this work, cognizance has been taken of the fact that machines and equipment, used commercially in developing ground water supplies, have evolved through years of experience of dependable manufacturers with the benefit of advice from skilled and critical well drillers. It has been possible for the most part to adapt available commercial equipment to specific military purposes.

A primary consideration in the development of well drilling equipment for military work is the decision relative to the proper accessory equipment and spare parts to accompany each machine going into the theater of operations. The spare parts problem is alleviated somewhat by standardization of equipment. Every effort is made to

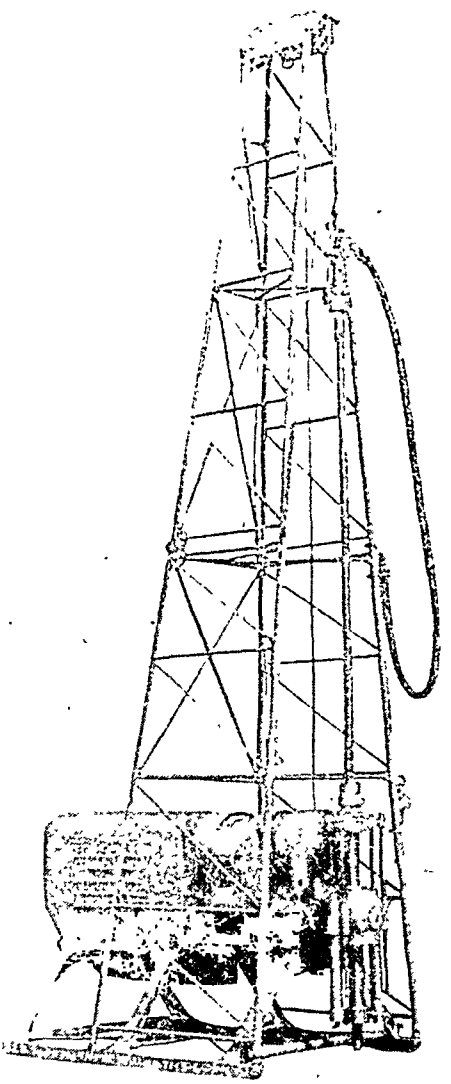


FIGURE 2—Lightweight Rotary Well Drilling Rig

control design so as to reduce maintenance to an absolute minimum. Army requirements place special emphasis on such features as flexibility, mobility, and maneuverability of equipment. Due consideration is given to such factors as weight and volume of equipment and supplies. Speed of drilling and the ability to produce water in a minimum of time are of paramount importance.

In the past, there has been considerable controversy over the relative merits of the rotary and the cable tool methods for drilling water wells. There are certain geologic conditions which dictate cable tool drilling and there are other conditions when the rotary drill must be used. Cable tools are unsatisfactory and at times inoperative in soft, loose, unconsolidated caving formations; such as dune sand, quicksand, unconsolidated river gravels and for small diameter deep holes in unconsolidated material. Rotary machines are unsatisfactory and at times inoperative in cavernous or extremely porous "lost circulation" zones. These limitations make it mandatory that a well rounded water well drilling organization have available both types of equipment and trained personnel capable of handling each type.

Development work with well drilling equipment has resulted in a lightweight rotary drill. The objective of this design has been to provide highly flexible equipment possessing maximum maneuverability. This equipment is designed for exploratory drilling and demolition work as well as prospecting for water wells. A hydraulically-actuated diaphragm mud pump is an interesting component of this rotary drill. The accompanying picture, Figure 2, illustrates the drill proper.

A considerable amount of work has been done in the development of hi-lift pumping equipment for small diameter water wells. The objective of this work has been to develop dependable pumping equipment which will give maximum production from small diameter water wells. Due to limitations of weight and transportation, it is impractical to drill normal industrial type, large diameter deep holes in field military operations. Design of deep well pumping equipment is consistent with capacities provided in the Army well drilling rigs and suitable for use in water wells drilled in world-wide military operations.

The development work pertaining to ground water has resulted in equipment which should prove valuable to the industry following the war. Data have been accumulated which should be of use in other phases of Corps of Engineers operations. Reference is made to application in pumping of mud fluids, slushes, cement grout, chemicals, and fluids containing suspended solids.

WATER DISTILLATION

The Engineer Board, in collaboration with interested manufacturers, has performed pioneering research in development of portable sea water distillation equipment. This development work was initiated late in 1940. Phenomenal progress has been made during this period and equipment is now available which gives economies heretofore considered fantastic.

Distillation equipment is used to produce potable water for troops, or water low in total solids for other military purposes, from sea water, brackish water, and other waters containing excessive amounts of dissolved solids. This development has resulted in portable, compact, self-contained equipment complete with power plant, source of heat, pumps, accessories, and controls. Design of this equipment has taken into consideration necessary ruggedness to withstand military handling and simplicity to assure satisfactory operation by soldier personnel.

Single effect, multiple effect, and thermocompression distillation equipment have been developed. This equipment may be classified into two groups according to the source of heat for operation:

1. Oil-fired in which heat is supplied to a steam generator or boiler by burning liquid fuel for single and multiple effect equipment.
2. Compression type in which heat for evaporating water is supplied from compressed steam.

Initially, development was focused on single and multiple effect direct oil-fired distillation equipment. Through a progressive development program, economies were realized up to 36 lb. of distillate per lb. of fuel consumed. Multiple effect distillation equipment utilizes latent heat of vaporization of steam generated in the first effect evaporator to evaporate additional water in subsequent effects, thereby increasing economy of the unit. Direct oil-fired stills possess certain inherent advantages in that they permit heating of water and production of steam for other military field uses.

Ferrous metals are utilized where possible in lieu of materials more resistant to corrosion by sea water. Extensive service of such equipment has shown that deterioration is not a serious factor and that the direct-fired equipment of essentially ferrous construction is satisfactory for military field use.

The objective in continued development of distillation equipment has been to increase economy without sacrificing weight, ruggedness, and simplicity. Compression type distillation equipment most nearly approaches this objective. The successful development of portable compression type distillation equipment constitutes an outstanding advancement in the field of distillation. The initial source of power and heat for compression type distillation is a water-cooled engine. The steam compression cycle is started by passing steam from the engine water cooler to the steam dome of the evaporator. Raw water which has been preheated in a highly efficient heat exchange system is passed into an

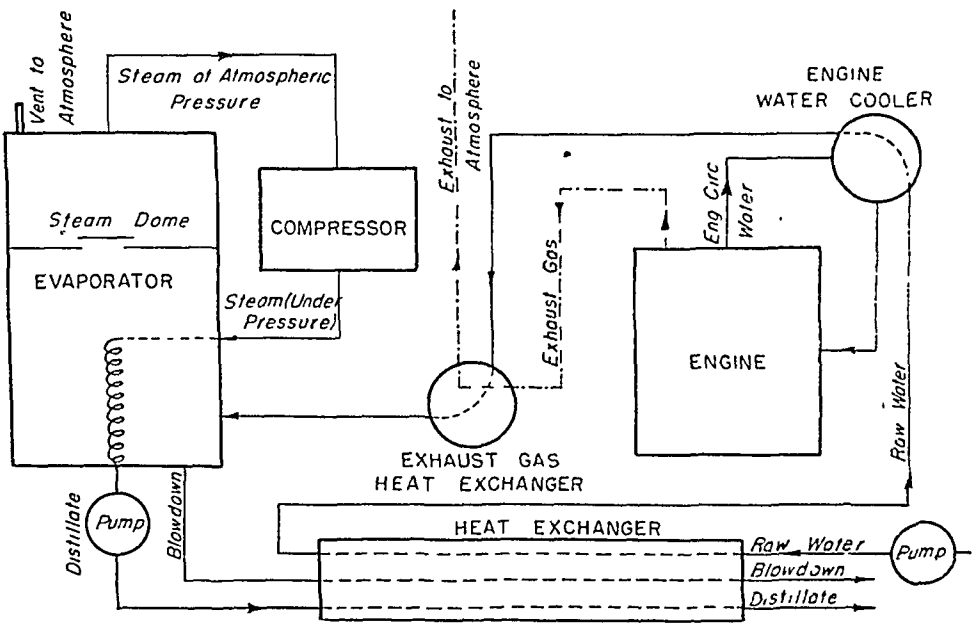


FIGURE 3—Flow Diagram of a Thermocompression Type Distillation Unit

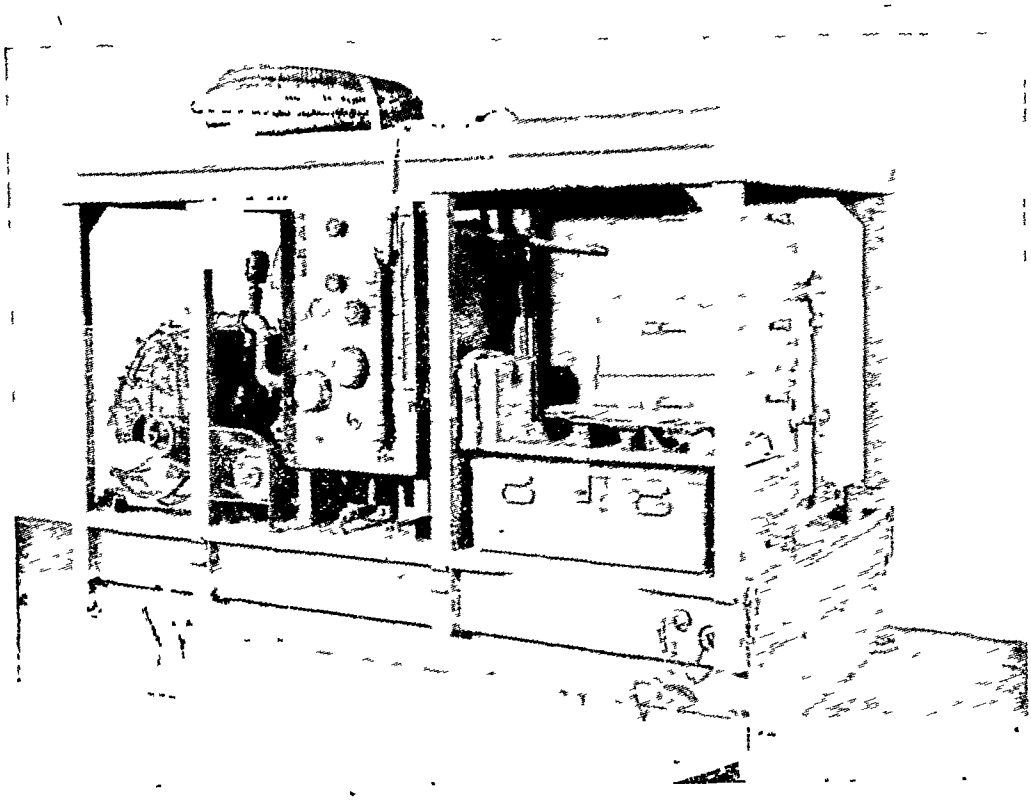


FIGURE 4—Thermocompression Water Distillation Unit

evaporator where it is converted into steam. This steam is compressed, thereby causing temperature rise. The compressed steam is returned to the condenser section of the evaporator, which surrounds the boiling section, where it is condensed, giving up its latent heat, thereby evaporating additional raw water. The operation is continuous, a small amount of brine being continuously discharged to waste through the heat exchanger system. Figures 3 and 4 illustrate the principle of thermocompression distillation.

Compression type distillation equipment is capable of producing well in excess of 100 lb. of distilled water per lb. of fuel consumed in the power unit. Recent design has substantially increased economies now realized. Compression distillation equipment is somewhat more complicated than direct oil-fired equipment, requiring a highly skilled operator, but once the equipment is in operation it requires no more attention than the less economical equipment.

Considering the magnitude of the supply problem, the importance in attaining maximum economy cannot be overemphasized. There is every indication that compression type distillation equipment is the ultimate in distillation. It is evident that this problem offers a most promising field for continued research. Recent technological development in sea water distillation has made available equipment which should have numerous industrial applications during the post-war period.

ION EXCHANGE

The development of modern ion exchange materials has made possible the design and construction of water desalting equipment which removes ionizable salts from water without the introduction of by-products by a process which in operation is comparable to filtration.

These desalting systems generally

consist of two units; the first, a bed of a material having the property of removing cations from solution by exchanging hydrogen ions for the sodium, calcium, magnesium, or other bases present in the water; and the second unit, a bed of an anion-active material that removes the mineral acids which the cation removal agents sets free by exchange of these acids with hydroxyl ions. When influent waters containing several thousand p.p.m. of salt are treated in this way, the results are unsatisfactory.

A desalting system has been developed commercially for brackish waters having total dissolved solids concentration as high as 7,500 p.p.m. This system produces effluent water which is substantially neutral. The system consists of four treating units operated in series. The first unit, as in the conventional process, consists of a cation-active material operating in the hydrogen cycle; the second unit, an anion-active material activated with a strong base; the third, a cation-active material also operating in the hydrogen cycle; and the fourth, an anion remover which has been so treated during activation or regeneration that its effluent is substantially neutral.

In this system, the fourth bed is regenerated with sodium bicarbonate solution, so that the bed is what is called bicarbonate activated to distinguish it from a soda ash or caustic soda activated bed, which is said to be hydroxyl activated. The second cation removes additional quantities of sodium ion both free and combined and it delivers to the fourth bed an influent which is acidic. When this acidic influent reaches the anion bed, the fixed mineral acids are removed and the free sodium ions, formed by splitting of neutral salts, are neutralized by the bicarbonate ion set free in the bed.

The advantages of such a system are: first, a capacity for ion removal of both the cation and anion units is definitely increased, as the first cation and first anion beds can be operated far past initial breakthrough of salt; second, rinse water losses are extremely low, as no water is wasted in washing the last traces of salt from the beds; and third, the effluent is practically neutral, or slightly acidic, due to the presence of carbonic acid.

An ion exchange unit designed in accordance with the principles described above, and as a mobile unit, has been constructed and is under service test. This investigation is intended to show the military utility of this process and to determine its feasibility for both field and fixed installations. Although the military value of this improved ion exchange process remains to be proved, its potentialities are apparent.

PROTECTIVE COATING SYSTEMS

Studies pertaining to corrosion control of metal water tanks have resulted in development of protective coating systems which will satisfactorily withstand water immersion. Valuable assistance in this work was received from the Technical Advisory Committee, Federation of Paint and Varnish Production Clubs. Considering that corrosion is a universal problem, it is believed that the results of this work may have general application.

It is of paramount importance that metal surfaces be clean and free of all scale and rust prior to painting. Sandblasting is the preferable method of surface preparation. Satisfactory results may be expected using 6 lb. of Ottawa sand per sq. ft. of surface at 100 lb. per sq. in. pressure. In addition to cleaning the surface effectively, the sandblast provides an excellent " tooth " for the paint film to adhere to.

Wire brushing may be used for surface preparation in lieu of sandblasting, but vigorous rubbing of the surface

with suitable abrasives is required. Following brushing, the surface is further cleaned with naphtha or turpentine for removal of grease and oils. Phosphate treatment of the cleaned surface is recommended. This consists of applying a 5 per cent phosphoric acid solution and allowing it to dry for one hour after which the surface is washed with warm water and thoroughly dried before painting.

A number of anti-corrosive materials were investigated and tested resulting in the conclusion that synthetic resinous compounds were best suited for use on truck and trailer-mounted metal water tanks. The phenolic, vinyl, and alkyd synthetic resins were thoroughly investigated and the phenolic resins in the unmodified form were found to possess the most satisfactory properties for this purpose.

The 100 per cent phenolic thermosetting resin, due to its heat-reactive property or tendency to polymerize into an infusible and insoluble condition when heated, was superior to other organic coatings tested. Five coats of this material are recommended, which give a film approximately six mils in thickness. Each coat is cured with hot air, the curing schedule varying from 200° F. for 30 minutes on the first coat to 375° F. for six hours as the final bake. Methods used in curing this type resin are important in that temperature may be regulated to control flexibility and impermeability of the finished coating. Corps of Engineers *Specification No. T-1690*, entitled "Protective Coating System for the Interior of Potable Water Tanks," gives details of this system.

Inasmuch as facilities are not always available for application of the thermosetting, phenol-formaldehyde type coating, there was a need for an air drying coating system. Two types of paint were developed for this purpose which make use of unmodified, oil soluble varnish resins. These are considered as alternates to the phenolic thermosetting coating. These two types are described in Corps of Engineers *Specification No. T-1715A* designated as "Protective Coating Materials and Application for the Interior of Potable Water Tanks."

Type I paint is an air drying coating which is pigmented with zinc dust and zinc oxide, 75 per cent by weight. The vehicle is of the unmodified para-phenyl-phenol-formaldehyde resin in linseed oil, having a 25 gal. oil length. The second type air drying paint contains 35 per cent iron oxide pigment by weight. The vehicle for Type II has a 25 gal. oil length and consists of the unmodified para-phenyl-phenol-formaldehyde resin in china wood oil.

The exceptional inhibiting properties of the zinc dust-zinc oxide paint and the covering properties of the iron oxide paint place these two materials among the best air dried protective coating systems tested. They possess the advantages of application by either brush or spray over a surface treated by wire brushing and they are readily cured by natural ventilation when time permits.

TREATMENT OF WATER CONTAMINATED WITH TOXIC MATERIALS

Possible denial of field water supplies through their contamination with toxic materials has long been a source of concern to the responsible agencies. That the situation has never really arisen makes the problem only more complex since it must be handled entirely on a speculative basis, theorizing such matters as possible contaminants, amounts expected, and practicality of treatment. Yet insurance measures against this potential danger cannot be neglected. Recent trends in warfare, such as the attention given reservoirs in Hong Kong and in the Ruhr district of Germany, coupled with the widespread use of non-toxic but nauseating bone-oil to

invalidate precious water points in the Tunisian campaign, emphasize the potential part water may play in war.

Consideration given to the development of treatment methods for Army field use must be confined to rational and practical viewpoints. A vast number of poisonous compounds are known, especially in the organic field, but a critical survey of these substances indicates that most could not be successfully employed as water contaminants. Some are not sufficiently soluble to produce toxic effects while others hydrolyze rapidly and become impotent. In the drug field alone, there are scores of poisonous compounds whose production difficulties, cost, and availability preclude their use in quantity. The more important substances remaining after preliminary eliminations include arsenic, cyanides, and the heavy metal salts among the inorganic compounds, and alkaloids, phenols, glucosides, phytotoxins, organic arsenicals, and the chemical warfare agents in the organic field.

The field treatment of water contaminated with toxic materials such as alkaloids, cyanides, inorganic arsenicals, glucosides, and the heavy metal salts is chiefly of academic importance since they would be encountered only in isolated instances of deliberate, premeditated sabotage. Detection alone suffices here, and in place of treatment such supplies would be by-passed in favor of others or water could be hauled in by motor transport from other producing sources in the area. Treatment only becomes necessary when all available sources are contaminated. This might occur if chemical warfare broke out and contamination of watersheds, surface supplies, and small reservoirs resulted from the use of airplane sprays or gas shells disseminated in either dust or liquid form.

The non-persistent chemical warfare agents present no great danger to water supplies, nor do the irritant smokes which contain arsenic but are difficultly soluble in water. Of chief concern are the vesicant agents toxic in water whose persistency could effect contamination of watersheds: Lewisite, sulfur mustard, and the nitrogen mustards. Also, a retreating army forced to abandon stores of these agents might still make effective use of them by jettisoning them in water supplies.

Much work has been done during the past few years investigating the removal of different toxic materials from water. For Army use a simple universal method is required, it being impractical to adopt several specific treatment processes for use with individual contaminants. Standard water works procedures alone are of value here, and throughout past work activated carbon has received the preferential consideration for this purpose. Activated carbon will adsorb toxic organic contaminants from water although it is not effective in the removal of inorganic cyanides, arsenic, or heavy metals. These, however, were discounted from consideration on other grounds.

The carbon treatment of contaminated water is not ideal, requiring as it does large amounts of carbon. It has, however, the virtues of simplicity, effectiveness with the most probable contaminants, and familiarity to water personnel. Recent work on water treatment at the Engineer Board has been devoted to evaluation of the commercial carbons in order to select the best all-round ones for treatment purposes. Many types of activated carbons are produced commercially for different uses, exhibiting high specificities which cause a wide variance in their removals of different materials. Of these only the finely ground grades are applicable to existing water supply equipment. Thirty-four of these carbons were evaluated against the most probable toxic contaminants, Lewisite,

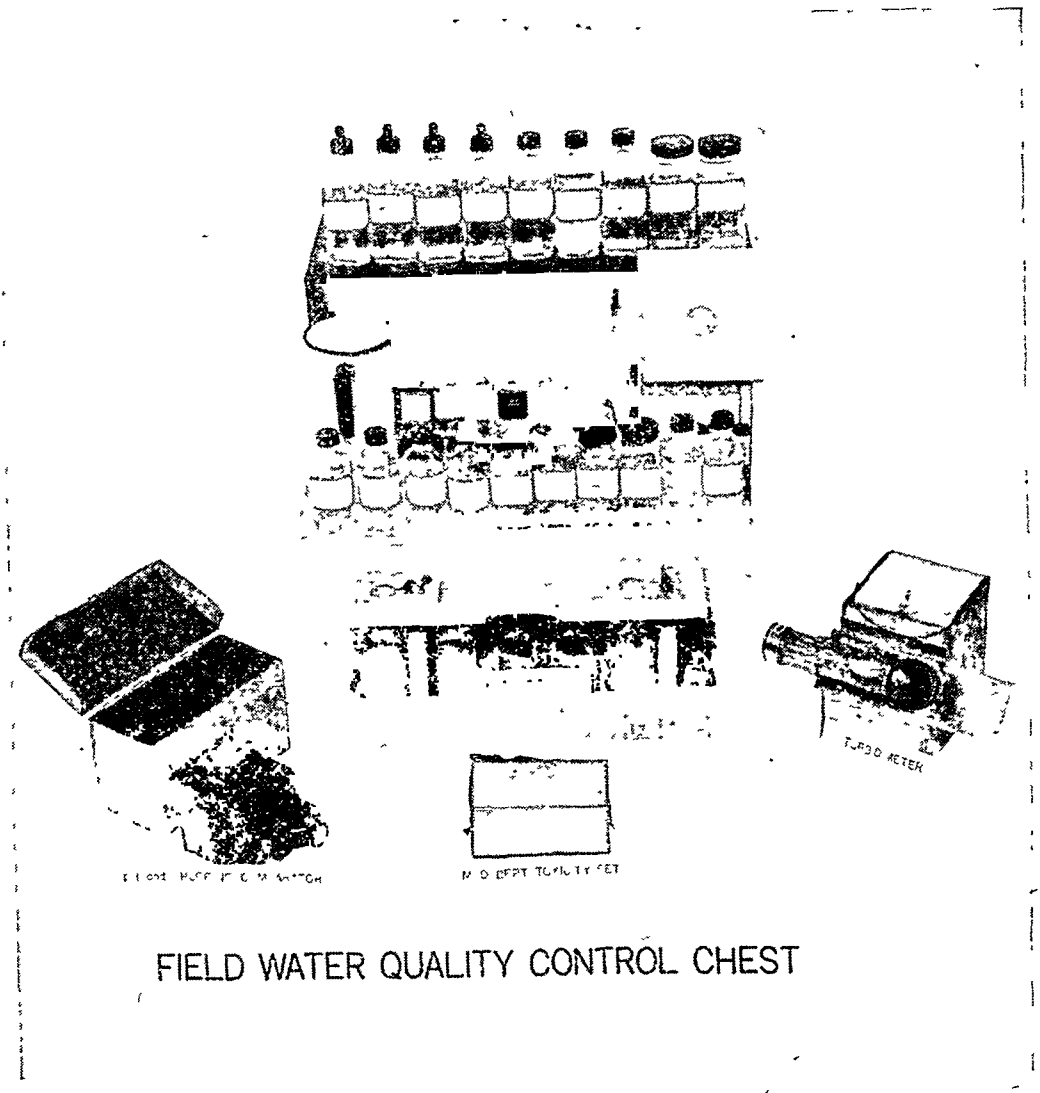


FIGURE 5—Field Water Quality Control Chest

Levinstein mustard, and nitrogen mustards. Results showed a wide range of effectiveness, with only a few outstanding carbons. From the adsorption isotherms developed through the laboratory evaluations, the parts per million required of the best carbon to remove each part per million of agent present, above the potable limit, were found to vary from 10:1 for Lewisite to 90:1 for nitrogen mustards.

It will be evident that the importance attached to treatment of water for removal of chemical agents will be dependent on future trends of the war. The results of work described herein, together with other studies not mentioned, afford protection against the contamination of drinking water sources resulting from chemical warfare.

PORTABLE LABORATORY FACILITIES

Routine control tests are invaluable to the operators of Army mobile and portable water purification equipment. These tests, of course, serve the same purpose with portable equipment as they do in fixed installations. However, authentic information regarding pollution sources is seldom available to personnel charged with the responsibility of operating Army water purification

equipment. Special significance is attached to control tests, and it is imperative that the operator have available means for measuring the efficacy of treatment.

A field water quality control chest, Figure 5, has been developed which is compact and relatively light. Facilities provided in this field laboratory are adequate for routine work and include specific tests for use under certain field conditions. Analytical procedures are essentially as recommended in *Standard Methods of Water Analysis*.

Design of this chest has taken into consideration the highly variable conditions experienced in a theater of operations. Tests are provided which will give a true measure of the performance of the equipment and a prompt appraisal of the quality of the finished water. This laboratory equipment makes possible technical control of the water treatment process. This control, together with constant vigilance in the inspection of the equipment and the water supply source, make possible efficient operation.

SUMMARY

The ramifications of world-wide water supply problems are almost endless. An attempt has been made to portray typical problems of Army water supply and developments resulting therefrom. Each development described is the answer to a definite need. Under duress of war every progressive idea, whose apparent worth stands the test of complete analysis, is given consideration in consonance with its potential value. This liberal attitude promotes rapid advancement not possible in peacetime. Many developments evolving from study of water treatment requirements in various parts of the world may well find application in American water works practice. The challenge of Army water purification problems of World War II invites continued support of technologists in public health.

Nutritive Value of Brined and Fermented Vegetables*

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THE urgency of the food production and preservation program which has faced this nation for the past year cannot be overemphasized. This critical food problem still remains unsolved. To assist in meeting the challenge presented, research men and commercial food processors alike are investigating the possibilities offered by all methods of food preservation.

The salting or brining of food is one of the oldest preservation methods practised by man. Today we recognize that this method still offers tremendous possibilities both for commercial and home preservation of many foods.

An adequate study of the nutritive value of foods preserved by any method should properly include a comparison of the nutritive quality of the processed foods with that of the fresh produce before processing. Generally speaking, a loss in nutrients takes place whenever food is processed whether such treatment be for the purpose of preservation or for cooking for table use. Such loss is dependent upon the products receiving treatment, the processing treatments given, and the care exercised during processing.

The nutrient constituents of a food deserving consideration in a preservation study include carbohydrates, proteins, minerals, and vitamins. There may be a loss of these constituents during food processing either through solution or leaching out of soluble constituents, or through destruction due to chemical changes during processing and storage. Also, since the brining process involves preservation as a result of, or accompanied by, microbiological activity, nutrients may be lost through utilization by microörganisms.

Throughout this discussion the term "brining" will be used whenever reference is made to the preservation of vegetables either through the use of solid salt or through the use of salt brines. Actually, in the preservation of vegetables by this method, the preservation action takes place in brine. The brine may be added as a solution of common salt or it may be formed as the result of the dissolving of solid salt in water withdrawn from the vegetables.

In this connection there seems to be a common belief that brining or salting may be done in such a manner that fermentation either will or will not take place depending upon the exact procedure followed. However, reports by the authors [1, 2] indicate that, throughout the range of brine strength employed in vegetable preservation (upwards of 90 per cent saturation), certain types of salt-tolerant microörgan-

* Presented before the Food and Nutrition Section of the American Public Health Association at the Seventy-second Annual Meeting in New York, N. Y., October 12, 1943

Approved for publication as *Paper No. 173* of the Journal Series of the North Carolina Agricultural Experiment Station. Agricultural Chemical Research Division Contribution No 123.

isms are able to grow and contribute to the general fermentation.

Hence, we consider that a distinction cannot be made between brining procedures strictly on a basis that they will either permit or prevent microbiological activity (fermentation) as the result of such treatments.

The brining of vegetables is an established part of the pickle manufacturing industry. Included among those vegetables so preserved are cucumbers, onions, peppers, tomatoes, and cauliflower. These brined vegetables receive a desalting treatment prior to manufacture into the finished pickle products. Such products have a definite place in our diet but represent a small part of the total food consumed.

The brine preservation of vegetables which can be consumed as non-pickle products, and which can contribute greatly to the food value of our diet offers a distinct possibility for both commercial and domestic-scale production. Vegetables which have been brined for use as non-pickle products include beets, carrots, celery, cauliflower, cabbage, okra, snap beans, green peas, lima beans, greens, and corn. These are important sources of proteins, starch, minerals, and vitamins in the diet.

The salt concentration employed in brining varies from 2½ to 25 per cent by weight, depending upon the vegetable receiving treatment. Sauerkraut from cabbage, or a similar product made from lettuce, turnips, or rutabagas, contains from 2 to 2½ per cent salt. Snapbeans preserved in a low-salt brine contain 5 per cent salt. These products are used in the diet directly without desalting.

Green peas, lima beans, corn, and similar vegetables are generally preserved by the use of either strong brines or large amounts of salt (15 to 25 per cent). In commercial practice snapbeans are mixed with 20 per cent solid salt. With such vegetables it is necessary to reduce the salt concentration materially before they are edible. The reduction in saltiness may be brought about in two ways: Either by the use of a small amount of the salted material in a large volume of soup or a similar preparation; or by soaking in a suitable volume of fresh water before preparing for table use.

The domestic brining of vegetables has been recommended over a period of years by several investigators [3–7] and by the Agricultural Extension Service in many states. Although this method has been repeatedly employed for food preservation, there have been very few reports concerning the nutritive value of such food.

Losses in nutritive constituents may occur, during preservation by brining in the following phases of the process: (1) during preparaton, such as peeling, slicing, or shelling, due to oxidation; (2) during blanching, as the result of leaching; (3) during fermentation as the result of microbiological activity; (4) during the curing and storage period through leaching or through chemical destruction; and (5) during desalting, largely as the result of leaching.

In general, in the brining of vegetables, the soluble carbohydrates or sugars are reduced to a low concentration either during the preservation process, or subsequently during desalting, if the latter process is required.

Brining procedures which are based on the preservation of vegetables at low or moderate salt concentrations (2½ to 10 per cent salt by weight) will be responsible for the complete destruction of the sugars present. This destruction occurs due to the utilization of the sugars by salt-tolerant microörganisms. Brining treatments utilizing high salt concentrations (15 to 25 per cent salt by weight) retard, but do not necessarily prevent, microbiological ac-

TABLE 1

Effect of Brining Treatments on the Protein Content of Certain Vegetables

Vegetables	Pre-brining Treatment	Brining Treatment Vegetables Covered with Brine of Strength Listed	Desalting Treatment	Protein Content Expressed as Percentage of Edible Substance: Preserved Material	Protein Content Expressed as Percentage of Edible Substance: Fresh Material	Protein Retention Per cent
Snap beans	Blanched 2 min. in boiling water	5% salt + vinegar	None	1.14	1.21*	94
Snap beans	None	"	"	0.88	1.86	47
Snap beans	"	15% salt	24 hrs.†	0.67	2.4‡	28
Lima beans (green)	"	"	"	4.85	7.5‡	65
Peas (green)	"	"	"	5.79	6.7‡	86

* Represents the protein value after blanching; initial fresh value was 1.86 per cent
† 1 lb brined vegetables in 1 gal. water
‡ Data by Chatfield and Adams [11]

tivity.[8, 9, 1] Vegetables preserved by such brining treatments may lose only a portion of their original sugar content during the preservation process. Fabian and Blum [9] have demonstrated, qualitatively, the presence of appreciable quantities of sugar in corn preserved in brines containing 15 and 20 per cent salt and in peas preserved in brine containing 20 per cent salt after a 6 month storage period. If the brined product is used in the diet in soups or in a similar manner not requiring desalting, the remaining sugar will not be lost. Desalting will effectively reduce the sugar concentration to a very low level irrespective of the amount of sugar which may remain at the end of the fermentation process.

The fate of starch during brine preservation has not, to our knowledge, been reported in the literature. Qualitative tests by the authors demonstrated that starch was present in brined snap beans, lima beans, and peas after a 15 month storage period. This is significant in view of the fact that snap beans, immature corn, peas, and lima beans contain appreciable quantities of starch.[11]

Certain proteins are water- and brine-soluble. These may be lost during hot water blanching, by draining away with the brine, or by desalting if these operations are followed. Also a portion of the protein fraction is utilized by the microörganisms associated with brine fermentations.

Relative to actual losses of protein during brining, there is but limited information reported. The protein content of cabbage and sauerkraut is reported as essentially the same in the tables prepared by Chatfield and Adams.[11] This should be the case provided there has been neither a loss of kraut juice nor a replacement of the juice with a fresh brine.

Table 1 lists the protein content of snap beans, and immature lima beans and peas in studies conducted by the authors. In every case a loss in protein has accompanied the brining operation. The extent of loss appears to vary with the kind of vegetables brined. Also, the short blanch given snap beans materially prevented protein loss with this vegetable.

These data further indicate that, in spite of the possibilities of loss in brining as pointed out above, brine-preserved vegetables when prepared for table use showed a marked retention of protein. The retention varied from a high of 94 and 86 per cent for blanched snap beans and unblanched peas respectively, to a low of 28 per cent for unblanched snap beans from a strong

brine. Attention is called to the fact that a 35 per cent loss resulted from the blanching treatment given the fresh snap beans. Subsequent loss of protein during the actual preservation and storage in brine was very small, as has been previously indicated. Due to the fact that the protein values for the fresh vegetables were not determined, the retention figures for the last three vegetables listed in Table 1 were estimated using the protein values for fresh material reported by Chatfield and Adams.[11]

The soluble minerals may be lost during the blanching, brining, or desalting operations. Commercial sodium chloride, however, carries a significant amount of impurities. Due to the quantity of salt employed in the preservation process, there may actually be an increase in the amount of certain mineral constituents other than salt as a result of brining. Peterson, Elvehjem, and Jamison [12] reported an increase of nearly 50 per cent in the iron content of sauerkraut as compared with the cabbage from which it was made.

The calcium content of brined snap beans, lima beans, and peas in studies conducted by the authors is listed in Table 2. A comparison of the brined with the fresh vegetable is not possible in all cases due to the fact that analyses for the mineral content were not made for all of the lots of fresh vegetables. Included in this table for comparison are values for the calcium content of these vegetables as listed in a table by Bridges and Mattice [13] of the mineral content of fresh vegetables. The data presented are interpreted as indicating that the calcium content of brine-preserved foods may be distinctly greater than that of the fresh vegetables which received treatment.

The influence of various food preservation methods on vitamin retention has recently received a great deal of study. Two of the vitamins, namely carotene (pro-vitamin A) and ascorbic acid (vitamin C), have received particular attention relative to their behavior during the treatments involved in food preservation. Carotene is water-insoluble, and although it may be destroyed by oxidation, it is comparatively stable. Ascorbic acid (vitamin C) is water-soluble and is rapidly destroyed by oxidation, especially enzymatically. It is also readily lost by diffusion into water or liquors employed during preservation and processing.

With reference to the behavior of carotene during the preserving of

TABLE 2

Effect of Brining Treatments on the Calcium Content of Certain Vegetables

Vegetables	*Pre-brining Treatment*	*Brining Treatment Vegetables Covered with Brine of Strength Listed*	*Desalting Treatment*	*Calcium Content Expressed as Milligrams of Calcium per 100 Grams of Edible Substance*		*Change Induced by the Treatments Per cent*
				Preserved Material	*Fresh Material*	
Snap beans	Blanched 2 min. in boiling water	5% salt + vinegar	None	24	28*	33 gain
Snap beans	None	"	"	19	18	6 gain
Snap beans	"	15% salt	24 hrs †	30	50‡	40 loss
Lima beans (green)	"	"	"	44	28‡	57 gain
Peas (green)	"	"	"	53	28‡	89 gain

*Represents calcium content after blanching; initial fresh value was 18 mg./100 gm.
† 1 lb. of vegetables in 1 gal. water
‡ Data from Bridges and Mattice [13]

TABLE 3

Influence of Brining Treatment on Carotene Retention in Certain Vegetables (After Etchells, Jones, and Hoffman [2])

Vegetables	*Brining Treatment. Vegetables Covered with Brine of Strength Given*	*Carotene Retention in Per cent*	*Time of Storage in Months*
Lima beans, unshelled, unblanched	Openheaded kegs out of doors 5% brine raised to 15% in 5 weeks 10% brine raised to 15% in 5 weeks 15% brine held at 15%	Distinctly under 50	4
Peas, unshelled, unblanched	As for lima beans	50	4
Snap beans, unblanched	As for lima beans	Distinctly under 50	4
Snap beans, blanched and unblanched	Closed kegs 4.5% brine plus vinegar. Held at 4.5%	90–95	10
Snap beans, blanched	Closed 1 quart jars 2.5, 5, .10 and 15% dry salt, no brine added	60	5
Leafy Vegetables— Kale, turnip greens and mustard greens, unblanched	Closed 1 quart jars 6.2% brine plus vinegar. Held at 6.2%	50	4–5
Carrots, blanched and unblanched	Closed 2 quart jars 6 2% brine plus vinegar. Held at 6.2%	Little or no loss	6

foods by brining there is but limited information available. Richardson, Mayfield, and Davis [14] reported that the vitamin A content of sweet corn preserved by salting (1 part salt to 7 parts corn by weight) and subsequently desalted and cooked was the same as raw, frozen corn. Furthermore, they found that sweet corn preserved by a brine acidified with vinegar and containing a low salt concentration possessed almost twice the vitamin A content of the raw, frozen corn taken as a basis of comparison.

Etchells and Jones [15] and Etchells, Jones, and Hoffman [2] reported studies on changes in carotene content during the brining of blanched and unblanched snap beans; unshelled lima beans and peas; unblanched leafy vegetables such as kale, mustard greens, and turnip greens; and blanched and unblanched carrots. These data have been summarized in Table 3. The results indicate that carotene losses vary markedly with the vegetable receiving treatment. Under the conditions of the experiments. carrots showed little or no loss of carotene, while lima beans and snap beans, brined and stored in openheaded kegs exhibited a loss of more than 50 per cent. In addition, the results indicated that the brining treatment greatly influenced vitamin retention. Snap beans brined and stored in tightly headed kegs which were filled with an acidified, low salt content brine retained from 90 to 95 per cent of their original carotene content during 7 month storage period in brine.

Blum and Fabian [16] have recently reported changes in carotene content of blanched and unblanched peas, snap beans, corn, and lima beans, preserved mainly with brines of high salt content over a storage period of from 6 to 9 months. The vegetables were brined in 5 and 10 gallon open crocks stored indoors. These investigators summarized their studies in part as follows: " (1) The lower the salt concentration the greater the loss in carotene. . . . (2) Vegetables that were blanched and then salted lost more carotene . . . than did unblanched salted

vegetables. (3) Vegetables differed in their ability to retain carotene . . . during fermentation and storage." These investigators also reported a carotene loss ranging from 2 to 17 per cent during the freshening of brined vegetables (peas, string beans, lima beans, and corn) taken from brines of high salt content. Whether this loss was real or apparent cannot be determined since the relative changes in weights of the material upon desalting were not reported.

By way of summarization of the data which has been reported on carotene losses the following observations seem justified. The loss is determined to a great extent by the vegetable under treatment and the brining method employed. Blanching of the vegetable prior to brining does not appear to favor carotene retention. Treatments employing the use of acidified brines appear to favor carotene retention materially in the preservation of snap beans; however, with vegetables such as carrots or leafy greens, such benefits have not been observed.

As mentioned earlier, ascorbic acid is water-soluble and, furthermore, it is readily oxidized, especially in non-acid media. Many vegetable tissues possess enzyme systems responsible for the rapid destruction of this vitamin.

Pederson, Mack, and Athawes,[17] after a detailed study of changes in the vitamin C content of sauerkraut during commercial manufacture arrived at the following conclusions: Raw kraut (solids plus juice) during and immediately after fermentation in large vats contains approximately the same amount of vitamin C as the original cabbage. During storage in vats after the fermentation, the vitamin C content slowly decreases. This loss in vitamin C appears to be associated with the loss of an atmosphere of carbon dioxide. Canned kraut contained only from 25 to 50 per cent as much vitamin C as freshly made kraut. This loss occurs during the processing of the kraut at the time of canning and does not continue during storage after canning.

Studies by Blum and Fabian [15] and Etchells, Jones, and Hoffman [14] on the brining of snap beans, peas, lima beans, and corn indicate that with these vegetables vitamin C is practically entirely lost. This loss occurs during the fermentation and storage period or during the desalting required to make the product edible, providing it has been preserved by the use of a large amount of salt.

As a part of our current investigations, cauliflower was brined according to several treatments as outlined in Table 4. After a storage period of nearly 7 months, the observed changes in the total ascorbic acid content of the brined cauliflower (vegetable plus brine) can be summarized as follows: Cauliflower preserved in acidified

TABLE 4

Ascorbic Acid Content of Cauliflower Brined According to Several Treatments (After 7 Months' Storage in Brine in Closed Containers)

Material	*Pre brining Treatment*	*Brining Treatment* *	*Ascorbic Acid Content*
Fresh Cauliflower	None	None	67 mg./100 gm.
Brined "	Not blanched	5% brine only	1% retention
Brined "	" "	5% brine + vinegar †	58% "
Brined "	" "	5% brine + lactic acid †	62% "
Brined "	Blanched	5% brine only	24% "
Brined "	"	5% brine + vinegar †	42% "
Brined "	"	5% brine + lactic acid †	50% "

* Vegetable covered with brine containing 5% salt and acid as shown. No additional salt added.
† Initial brine acidity approximately 0.5 per cent when calculated as lactic acid.

brines showed an approximate retention of 60 per cent for the unblanched, and 46 per cent for the blanched lots. On the other hand, cauliflower preserved in non-acidified brines showed a retention of less than 1 per cent for the unblanched, and 24 per cent for blanched lots. This experiment is a striking example of marked ascorbic acid retention obtained by particular brining methods. Substantial ascorbic acid retention was obtained not only on a percentage basis but also on a quantitative basis. The unbrined cauliflower possessed an ascorbic acid content of 67 mg. per 100 gm. and after 210 days' storage in brine, the acidified lots still retained approximately 60 per cent of that amount (based on the total ascorbic acid present in the vegetable and brine).

There is little published information regarding the effect of brine preservation on vegetables in relation to retention of B vitamins. Richardson, Mayfield, and Davis [12] found that corn preserved by salting, after desalting and cooking contained about one-fourth the vitamin B_1 content of raw, frozen corn. Preliminary work by the authors under way at this time on the riboflavin content of peas and snap beans, preserved according to a variety of brining and salting treatments, indicates that an appreciable amount of this vitamin is retained by these vegetables.

CONCLUSION

In conclusion it should be pointed out that the use of vegetables, which have been preserved in strong brines, in a manner not requiring desalting will result in the greatest conservation of nutrient constituents. This can be accomplished through the use of the brined material in the preparation of soups or certain vegetable mixtures.

In the absence of desalting, the total protein retention is high, and mineral losses are small; carotene retention is fair and thiamin and riboflavin may be present in significant amounts. The sugars and ascorbic acid are generally lost during the fermentation period and during brine storage.

When desalting is practised in the preparation of brined foods for table use, somewhat greater losses in protein and minerals may be encountered. The desalting operation will effectively reduce the concentration of the sugars, ascorbic acid, and probably the B vitamins to a very low level. Such losses will be in keeping with degree of dilution required adequately to reduce the salt content.

It has been shown that certain vegetables which are important sources of proteins, starches, and minerals, are well adapted to brine preservation and can be used as non-pickle products. Furthermore, the data presented show that these constituents may be well retained in such brine preserved vegetables. Accordingly, at this time of acute shortages in food supplies, of limitations in labor, transportation facilities, and food processing equipment, it behooves us to give serious consideration to the possibilities of food preservation offered by the brining method.

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From July 25 to August 5, the College of Education and the School of Public Health, University of Minnesota, offer a two week workshop to school and community health education leaders. Members will be given an opportunity to work in special interest groups as well as in sessions with the group as a whole. There will be opportunities for independent study as well as field trips, observations, and individual and group conferences.

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The Workshop Faculty includes Ruth E. Grout, Ph.D., Harold H. Walker, Ph.D., Eva G. Donelson, Ph.D., Ruth B. Freeman, R.N., Helen M. Starr, Donald A. Dukelow, M.D., and Harold K. Jack.

Registration procedure, fees and information with regard to working or living facilities can be obtained from Ruth E. Grout, Ph.D., Associate Professor, College of Education and School of Public Health, 121 Millard Hall, University of Minnesota, Minneapolis 14, Minn.

Factors Affecting Germicidal Efficiency of Chlorine and Chloramine*

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REPORTS in the literature disclose a marked divergence of opinion on the relative germicidal efficiency of chlorine and chloramine. Rideal (1910) observed that when an equivalent of NH_3 was added to sodium hypochlorite (1 per cent available chlorine) made by electrolysis, the phenol coefficient rose from approximately 2 for the hypochlorite to 6 for the ammoniated solution (chloramine). It should be noted that the solutions employed were distinctly alkaline.

During World War I difficulties in obtaining an adequate supply of chlorine led Race (1918) to utilize ammonia in conjunction with chlorine for sterilization of the water supply of Ottawa, Canada, with a view to conserving chlorine. He reported experiments in which it was observed that ammoniated bleach solution containing 0.2 p.p.m. available chlorine and 0.1 p.p.m. ammonia was as effective a germicide as was 0.6 p.p.m. available chlorine when employing bleaching powder alone.

Tilley (1920) observed that addition of ammonia to Dakin's solution resulted in an increased germicidal efficiency whereas when ammonia was added to chlorinated water a drop in germicidal properties was effected.

Holwerda (1928) and Gerstein (1931) studying the germicidal efficiency of chlorine-water (with and without addition of ammonia) reported that the germicidal properties were greater when ammonia was not present.

Charlton and Levine (1937) suggested that the conflicting reports in the literature on the germicidal efficiencies of chlorine and ammonia-chlorine (chloramine) solutions might be reconciled if influence of reaction (pH) on the disinfecting properties of these two types of chlorine compounds was taken into consideration.

The objectives of the following brief report are to present data on the relative effects of such factors as (1) presence of ammonia, (2) reaction (pH), (3) concentration, and (4) temperature, on the germicidal efficiencies of chlorine and chloramine, in the absence of organic matter.

TECHNIC

The test organism employed was a suspension of *Bacillus metiens* spores prepared in the following manner: The growth from 20 day–30° C. agar slant cultures was washed off in Butterfield Formula C water and filtered through Whatman No. 2 filter paper to remove clumps. The filtrate was then heated

* Based on data from laboratories of the Department of Bacteriology and the Engineering Experiment Station, Iowa State College, Ames, Iowa. Presented before the Engineering Section of the American Public Health Association at the Seventy-second Annual Meeting in New York, N. Y., October 13, 1943.

at 80° C. for 10 minutes to destroy vegetative cells. This spore suspension, stored at 5° to 10° C., did not disclose any appreciable change in resistance to chlorine for a period of over a year and therefore lends itself particularly well to comparative studies over a long period of time. Just prior to use a portion of the suspension was diluted to approximately 20 million viable spores per ml.

Previous observations had disclosed that the reaction of alkaline unbuffered chlorine solutions tends to become more acid on exposure to air and stirring. All experiments reported herein were therefore carried out in M/20 concentration of appropriate buffers at desired reactions (pH), which were determined with the glass electrode. All water employed in the following experiments was ammonia-free when tested with Nessler's reagent.

Chlorine solutions were prepared by diluting a saturated stock solution made by passing gaseous chlorine into ammonia-free water. This saturated chlorine was kept in a glass stoppered bottle painted black on the outside and stored in a refrigerator at approximately 10° C. Under these conditions the chlorine content was found to remain quite constant. Ammonium sulfate was the source of ammonia, but all computations are made as NH_3.

The procedure for determining germicidal efficiency was briefly as follows:

To 75 ml. of an appropriately buffered solution, containing a desired concentration of NH_3, was added 25 ml. of chlorinated water containing the desired concentration of chlorine, and the flask containing the mixture was placed in a water bath. One ml. of the spore suspension (diluted so as to contain about 20 million viable cells per ml.) was placed into 100 ml. of the test solution which was being constantly stirred. (This would yield an initial inoculum of one million viable cells per 5.0 ml. of the test solution. The number of viable spores was determined by plating a portion of the spore suspension on nutrient agar.) At the time that the spore suspension was introduced into the disinfecting mixture, the concentration of available chlorine was determined for a duplicate sample by titration with sodium thiosulfate in acid solution.

At desired time intervals, 5 ml. portions were withdrawn and placed in 45 ml. of sterile water containing sufficient sodium-thiosulfate to neutralize any residual chlorine, and the number of surviving bacteria was ascertained by plating on nutrient agar (24 hour 30° C.).

Curves were then made by plotting the logarithms of the percentage of survivors against the period of exposure in minutes, and the time for effecting a reduction of 99 per cent of the exposed spores was read from the curves and designated as the killing time (K.T.).

The question might readily be raised as to why spores were used and whether the results are applicable to water sterilization. With reference to the first question, it might be pointed out that chlorine is so effective a germicide that when employing vegetative cells the rate of death is so high (and the concentrations of chlorine employed necessarily being very low and therefore subject to wide errors in determination as well as to combination with traces of such compounds of ammonia which might inadvertedly be present), that observations on rates of death and the effects of variations in temperature and reaction or concentration on these rates would be extremely difficult to carry out.

In contrast to this, by utilizing spores, it is feasible to employ high concentrations of chlorine which would not be affected appreciably by traces of impurities; studies over a wide range

of reaction, concentration, and temperature, are possible and the rates of death are sufficiently low so that patterns of the survivor curves may be readily observed. Furthermore, it is very difficult to obtain vegetative cells of uniform resistance; whereas the spore suspension employed was found to be strikingly uniform in resistance to chlorination and could therefore be employed over a long period of time for comparative studies.

As to the question whether the results with spores would be indicative of what might be expected with vegetative cells, it might be pointed out that survivor curves obtained by the authors for spores exposed to chlorine and chloramine were later confirmed by Schmelkes for *Escherichia coli* and that the relative efficiency of chlorine and chloramine reported for spores was recently found to hold for vegetative cells. Thus, Weber, Bender, and Levine (1940) reported that *B. metiens* spores exposed to approximately 22 p.p.m. available chlorine (as hypochlorite) were killed in 3 minutes, whereas it required about 28 times as long (approximately 85 minutes) when the same concentration of available chlorine was employed as chloramine. Streeter (1943) reports a killing time of 2–3 minutes for *E. coli* when employing 0.05 to 0.1 p.p.m. chlorine as compared with 40 to 90 minutes for the same concentration of available chlorine as chloramine. The relative killing times of chlorine as compared with chloramines for spores and vegetative cells, respectively, were therefore quite similar.

SURVIVOR CURVES FOR DISINFECTION WITH CHLORINE AND CHLORAMINE

In Table 1 and Figures 1 and 2 are shown results illustrative of the rates of death of spores exposed to chlorine and chloramine. In survivor curves for disinfection with chlorine, there are exhibited distinct periods of lag in rates of death—very prolonged when employing high alkaline solutions, low temperatures or low concentrations—followed by progressively increasing death rates. Thus, with chlorine at pH 7, 24 per cent of the exposed spores died in the 1st minute, 49 per cent of

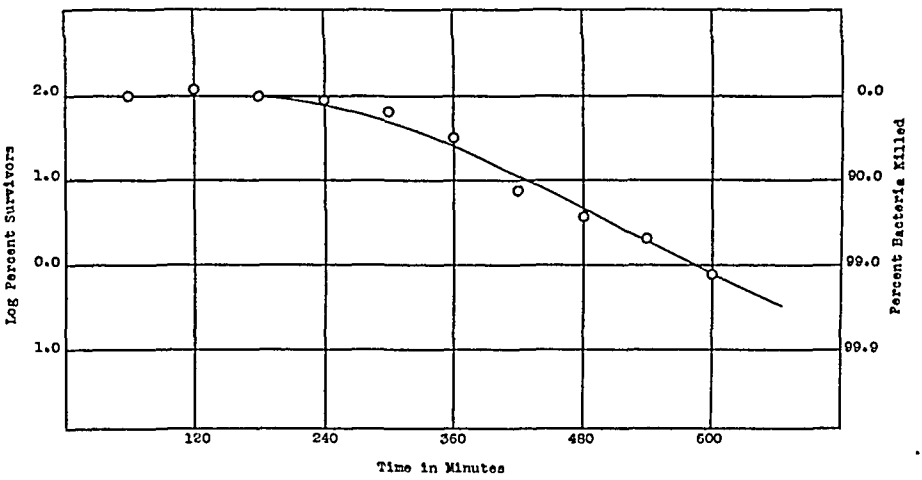
TABLE 1

Showing Per cent Reduction of Surviving Bacillus metiens Spores in Consecutive Equal Periods of Exposure to Chlorine and Chloramine at 20° C.

Chlorine			Chloramine		
*Time in Min.**	*Per cent Surv.†*	*Per cent Red.‡*	*Time in Min.**	*Per cent Surv.†*	*Per cent Red.‡*
			pH 10		
0	100	..	0	100	..
60	100	0	30	53	47
120	100	0	60	23	57
180	94	6	90	12	47
240	78	17	120	5.4	58
300	60	23	150	2.9	60
360	29	52	180	1.0	50
420	10	66	210	0.5	50
			pH 7		
0	100	..	0	100	..
1	76	24	20	72	28
2	39	49	40	28	61
3	1.1	97	60	9.8	65
			80	1.7	83
			100	0.6	65

* Period of Exposure (in minutes) to germicide
† Per cent survivors after stipulated periods of exposure
‡ Per cent reduction of survivors in consecutive equal periods of exposure

Fig.1
RESISTANCE OF B. METIENS SPORES TO CHLORINE AT pH 10.0
(25 p.p.m. Av. Cl.; 20° C.)



those which survived 1 minute died in the 2nd minute, and 97 per cent of the then remaining cells died in the 3rd minute of exposure. In the series with chlorine at pH 10, there was no decrease in bacterial count for 2 hours. This was followed by a progressively increasing rate of death. Thus, during the 3rd hour, only 6 per cent of the survivors after 2 hours were killed; 24 per cent of the spores which survived for 4 hours were killed in the 5th hour; whereas of those which survived 6 hours, 66 per cent were killed during the 7th hour of exposure.

In contrast to these curves of increasing death rates observed with chlorine (Figure 1), disinfection with chloramines discloses but short lags followed by quite constant death rates throughout the period of disinfection, so that the survivor curves are practically straight lines (Figure 2).

EFFECT OF AMMONIA ON CHLORINE RESIDUAL

In Table 2 are shown the residuals remaining 60 minutes after addition of approximately 25 p.p.m. available chlorine to solutions containing various

Fig. 2
RESISTANCE OF B. METIENS SPORES TO CHLORINE AND AMMONIA AT pH 10.0
(25 p.p.m. Av. Cl.; 6 p.p.m. NH_3; 20° C.)

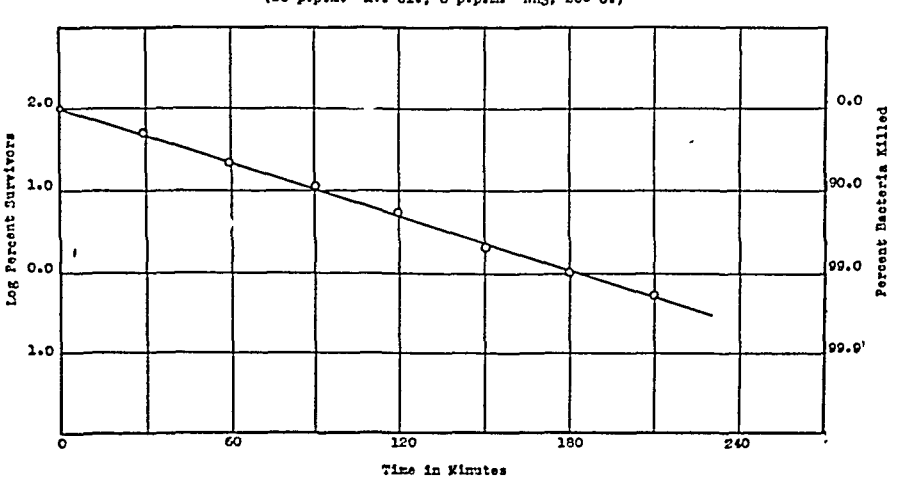


TABLE 2

Effect of Presence of Ammonia on Residual Available Chlorine

Reaction			pH 5	pH 6	pH 7	pH 8	pH 9	pH 10
			Residual Available Chlorine (p.p.m.) 60 Minutes after Admixture					
Series	NH_3 Added (p.p.m.)	Cl/NH_3*						
A	0.0		24.2	23.4	23.2	22.0	24.2	24.2
B	0.5	50/1	21.3	19.8	19.4	18.6	20.4	21.1
C	2.0	12.5/1	10.2	10.8	7.3	7.7	10.9	11.7
D	6.0	4.2/1	22.1	21.8	21.1	19.6	22.6	23.2
E	18.0	1.4/1	23.4	23.4	23.0	21.6	22.9	23.1
			Decrease in Residual Av. Cl. (p.p.m.) Over Series Without Added Ammonia †					
B	0.5	50/1	2.9	3.6	3.8	3.4	3.8	3.1
C	2.0	12.5/1	14.0	12.6	15.9	14.3	13.3	12.5
D	6.0	4.2/1	2.1	1.6	2.1	2.4	1.6	1.0
E	18.0	1.4/1	0.8	0.0	0.2	0.4	1.3	1.1
			Decrease in Residual Av. Cl. (p.p.m.) per p.p.m. Ammonia Added †					
B	0.5	50/1	5.8	7.2	7.6	6.8	7.6	6.2
C	2.0	12.5/1	7.0	6.3	7.9	7.2	6.7	6.3
D	6.0	4.2/1	0.4	0.3	0.4	0.4	0.3	0.2
E	18.0	1.4/1	0.0	0.0	0.0	0.0	0.1	0.1

* Approximate ratio of available chlorine to ammonia on basis that 25 p.p.m. available chlorine had been added

† To nearest 0.1 p.p.m.

concentrations of ammonia (added as ammonium sulfate) and buffered at reactions pH 5 to pH 10. The losses in residual chlorine per p.p.m. ammonia added are also indicated. It will be noted that when the ratio of chlorine to ammonia was high (12.5/1 and 50/1) there was considerable loss of chlorine (approaching about 7.5 p.p.m. chlorine lost per p.p.m. ammonia added) and that this loss was greatest in solutions near the neutral point; but, as the relative concentration of ammonia increased (ratio of chlorine/ammonia = 4.2/1 or less) the loss of chlorine became negligible. In general, if the concentration of NH_3 is less than about one-eighth that of the available chlorine, NH_3 will be oxidized and the chlorine residual (which will be reduced in proportion to the quantity of ammonia present) will consist of hypochlorite. The effect is therefore merely to reduce the concentration of the active germicide but its nature is unaltered. If, however, the concentration of ammonia is more than one-quarter that of available chlorine, then chloramines will be formed and the effect is to change the nature of the germicide, whereas the concentration of available chlorine is only slightly altered. With a chlorine/ammonia ratio of 4.2/1 the available chlorine is presumed to exist as chloramine, the relative concentrations of the mono and dichloramine being a function of the reaction.

EFFECT OF REACTION ON GERMICIDAL EFFICIENCY OF CHLORINE, CHLORAMINE, AND CHLORAMINE WITH EXCESS AMMONIA

Observations were made at reactions of pH 5 to pH 10, employing the following solutions to which were added chlorinated water to yield approximately 25 p.p.m. available chlorine.

Series I. Buffered water (chlorine as hypochlorite)

Series II. Buffered water containing 6 p.p.m. NH_3 (chlorine as chloramine)

Series III. Buffered water containing 18 p.p.m. NH_3 (chloramine with excess NH_3)

The test organism was introduced into the disinfecting solution 15 minutes after addition of chlorine and the temperature was maintained at 20° C.

TABLE 3

Effect of Reaction (pH) on Germicidal Efficiency of Chlorine, Chloramine, Chloramine with Excess Ammonia

(*Bacillus metiens* spores; app. 25 p.p.m. av. cl.; 20° C.)

Reaction			pH 5	pH 6	pH 7	pH 8	pH 9	pH 10
Series	NH_3 Added (p.p.m)	Cl/NH_3*	Killing Time (in minutes)					
I	0		2.1	2.3	3.0	7.6	58.0	570.0
II	6	4.2/1	168.0	85.0	89.0	83.0	182.0	186.0
III	18	1.4/1	99.0	59.0	84.0	107.0	263.0	456.0
Series	NH_3 Added (p.p.m.)	Cl/NH_3	Initial Residual Chlorine †					
I	0		24.2	23.4	23.0	22.0	24.2	24.2
II	6	4.2/1	22.6	21.8	23.6	22.0	23.0	23.0
III	18	1.4/1	23.3	23.1	23.4	22.8	22.6	23.0

* See Table 2

† At time of addition of test organism (15 minutes after addition of chlorine)

In Table 3 are shown the initial residual chlorine concentrations (at time of introduction of test organisms) and the killing times (time to kill 99 per cent of the exposed spores).

Comparing Series I (chlorine) with Series II (chloramine), several things are strikingly evident. For chlorine, germicidal efficiency was a direct function of reaction. The killing time varied slightly, from 2.1 minutes at pH 5, to 7.6 minutes at pH 8, thereafter increased very rapidly to 58 minutes at pH 9, and 570 minutes at pH 10.

In marked contrast to this, there was no significant difference in the killing times (83 and 89 minutes) for chloramine (Series II) in the range pH 6 to pH 8, whereas for solutions more acid (pH 5) and more alkaline (pH 9 and pH 10) the killing times (168 and 186 minutes) were approximately double those in the range pH 6 to 8.

The effect of presence of a large excess of ammonia on germicidal efficiency of chloramine may be noted by comparison of Series II and III. At pH 7 the killing times (89 and 84 minutes) were the same within limits of experimental error of determination. Chloramine in the presence of a large excess of ammonia (Series III) was more effective at pH 5 and pH 6 but distinctly less effective as a germicide at pH 9 and pH 10 than was chloramine solution in which there was not present any excess of ammonia.

The data for chlorine (Series I) and the chloramine (Series II and III) are shown graphically in Figure 3 where the logarithms of the killing times are plotted against the reactions (pH). The curves for chlorine and chloramine cross at pH 9.4. At reactions more acid than pH 9.4 chlorine is markedly more effective, whereas at more alkaline reactions chloramine is the more efficient. In this connection it might be pointed out that the increased germicidal effect produced by addition of an equivalent of ammonia to electrolyzed hypochlorite solution, first noted by Rideal (1910), was probably associated with the fact that he was working with sodium hypochlorite which was quite alkaline.

The greater germicidal efficiency of chloramine as compared with hypochlorite at reactions more alkaline than pH 9.4 may be particularly significant in conjunction with chlorination of softened water and water treated by the excess lime process, if reactions of about pH 10 are maintained.

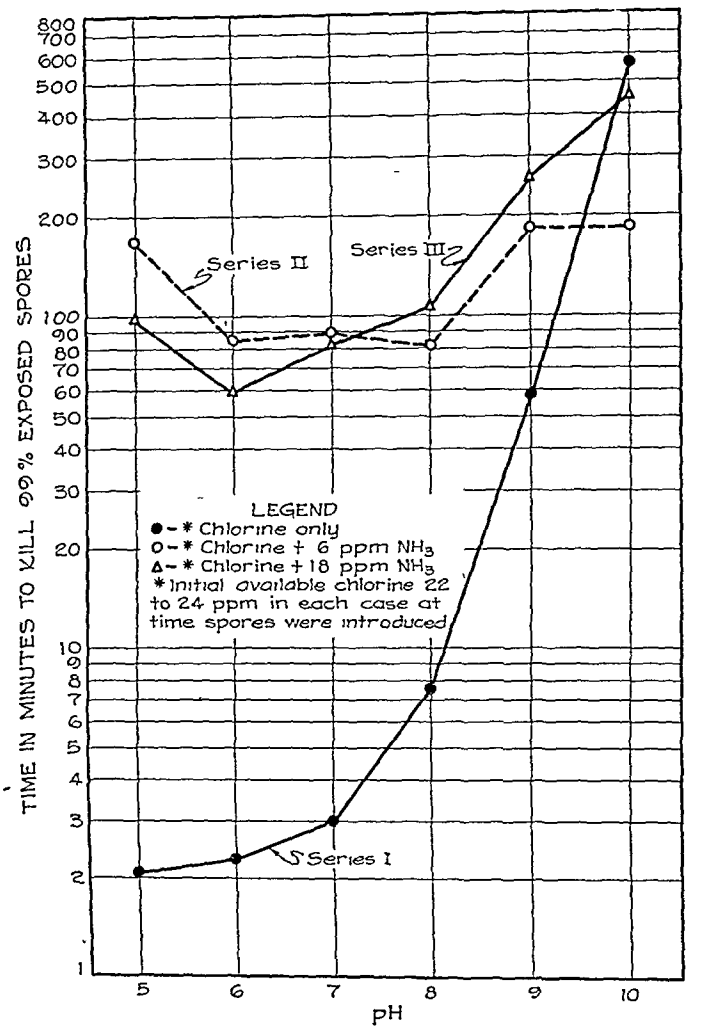


FIG. 3 EFFECT OF REACTION (pH) AND AMMONIA ON GERMICIDAL EFFICIENCY OF CHLORINE (20°C)

EFFECT OF CONCENTRATION ON GERMICIDAL EFFICIENCY OF CHLORINE AND CHLORAMINE AT VARIOUS REACTIONS

Killing times for each of four concentrations of chlorine and chloramine were determined for reactions pH 10, pH 7, and pH 5 at a temperature of 20° C. The data are shown in Table 4.

With chlorine, the results were very consistent. They indicated that by doubling the concentration, the time required to kill 99 per cent of the exposed spores was reduced by 45 to 50 per cent or, to put it conversely, as the concentration of available chlorine was cut in half the period of exposure (or killing time) was increased 1.8 to 2.0 fold. This seemed to hold true for each of the reactions under observation.

The results were more erratic with chloramine but indications were that the effect of varying concentration was somewhat less marked than was observed with chlorine and that a reduction of 35 to 40 per cent may be expected on doubling the concentration, i.e., the period of exposure would have to be increased 1.6 to 1.7 fold if the concentration of chloramine were reduced by 50 per cent.

TABLE 4

Relation of Concentration to Germicidal Efficiency of Chlorine and Chloramine

(*Bacillus metiens* spores; app. 25 p.p.m. av. cl.; 20° C.; pH 5, 7 and 10)

Chlorine				*Chloramine*			
Av. Cl.	*"KT" (Min.)* ‡	*Per cent Red.* "KT"*	*Relative† Increase "KT"*	*Av. Cl.*	*"KT" (Min.)* ‡	*Per cent Red.* "KT"*	*Relative† Increase "KT"*
	pH 10				*pH 10*		
24.2	570	..	...	23.0	186	..	...
47.0	291	49	2.0	41.5	95	49	2.0
94.3	170	41	1.7	84.6	60	37	1.6
188.0	98	43	1.8	140.0	51	15	1.2
Average		44	1.8	Average		33	1.6
	pH 7				*pH 7*		
6.3	11.7	..	...	11.3	110	..	...
12.4	5.4	54	2.2	23.6	89	19	1.2
23.0	3.0	45	1.8	44.7	41	53	2.2
48.6	1.4	53	2.1	86.4	27	34	1.5
Average		51	2.0	Average		35	1.6
	pH 5				*pH 5*		
6.3	8.5	..	...	11.4	251	..	...
12.5	3.8	55	2.2	22.6	168	33	1.5
24.2	2.1	45	1.8	44.4	77	53	2.1
49.3	1.2	43	1.8	87.0	47	39	1.6
Average		48	1.9	Average		42	1.7

* Per cent reduction in "KT" effected by approximately doubling concentration av. cl.
† The number of fold increase in "KT" if concentration of available chlorine is approximately halved
‡ "KT" = Killing time, i.e., period of exposure to effect destruction of 99 per cent exposed spores

TABLE 5

Relation of Temperature to Germicidal Efficiency of Chlorine and Chloramine

(*Bacillus metiens* spores; app. 25 p.p.m. av. cl.; pH 5, 7 and 10)

Chlorine					*Chloramine*				
Temp. ° C.	*Av. Cl. (p.p.m.)*	*"KT" Min.*‡	*Per cent Red. "KT"* *	*Relative Increase "KT" (Q 10)*†	*Temp. ° C.*	*Av. Cl. (p.p.m.)*	*"KT" Min.*‡	*Per cent Red. "KT"* *	*Relative Increase "KT" (Q 10)*†
	pH 10					*pH 10*			
20	24.2	570	..	...	20	23.1	186	..	...
30	23.3	240	58	2.4	30	21.7	46	75	4.2
40	23.2	100	58	2.4	40	22.3	11.2	76	4.2
50	22.8	46	54	2.1	50	20.7	3.3	71	3.4
Average			57	2.3	Average			74	3.9
	pH 7					*pH 7*			
0	24.5	12.9	..	...	20	23.6	89.0	..	...
10	24.2	6.2	52	2.1	30	22.1	29.5	67	3.0
20	23.0	3.0	51	2.1	40	21.3	8.6	71	3.4
30	24.1	1.4	53	2.1	50	19.3	2.9	66	3.0
Average			52	2.1	Average			68	3.1
	pH 5					*pH 5*			
0	24.8	10.0	..	...	20	22.6	168	..	...
10	24.5	4.3	57	2.3	30	21.5	38	77	4.3
20	24.2	2.1	51	2.1	40	20.6	11.3	70	3.4
30	24.1	1.2	43	1.8	50	20.7	3.8	66	3.0
Average			50	2.1	Average			71	3.6

* Per cent reduction in "KT" effected by a rise of 10° C.
† The number of fold increase in "KT" effected by a drop of 10° C.
‡ See Table 4.

EFFECT OF TEMPERATURE ON GERMICIDAL EFFICIENCY OF CHLORINE AND CHLORAMINE AT VARIOUS REACTIONS

Observations on the effect of temperature were made employing approximately 25 p.p.m. available chlorine at reactions pH 10, pH 7, and pH 5. Temperatures of 20°, 30°, 40°, 50° C. were employed for all observations with chloramine and for the chlorine solution at pH 10, but at the more acid reactions, temperatures of 0°, 10°, 20°, and 30° C. were employed for the chlorine series. The data are detailed in Table 5.

Generally speaking, the temperature coefficients seem to be relatively slightly influenced by reaction, but they are significantly different for the two compounds. Thus, with chlorine, a rise of 10° C. effected a reduction of 50 to 60 per cent in the killing time so that for a drop of 10° C. the period of exposure would have to be increased 2.1 to 2.3 fold. With chloramine, on the other hand, a rise of 10° C. is accompanied by a reduction of approximately 68 to 74 per cent in killing time; i.e., a drop of 10° C. entails a 3.1 to 3.8 fold increase in the period of exposure to effect the same bacterial reduction. The practical significance of the foregoing observations might be illustrated by the following example: If a contact period of 30 minutes at 20° C. is considered adequate for safety for a stipulated residual chlorine, the contact period would have to be raised to 60 to 70 minutes if the residual were chlorine (hypochlorite) or to 95 to 115 minutes for a chloramine residual, should the temperature of the water fall to 10° C. If the temperature of the water approached 0° C. then the period of contact for a stipulated chlorine (hypochlorite) residual would have to be increased to 130 to 160 minutes, whereas for a chloramine residual a contact period of 290 to 430 minutes would have to be employed to effect an equivalent germicidal action.

SUMMARY

A technic is described for determining the nature of survivor curves and the time required to effect a reduction of 99 per cent of *Bacillus metiens* spores exposed to chlorine and chloramine at various reactions and temperatures.

On the basis of previous findings and reports in the literature, results obtained with spores are considered applicable to those which might be anticipated for vegetative cells exposed to chlorination.

In disinfection with chlorine there was exhibited a marked lag followed by progressively increasing death rates; whereas with chloramine the rates of death were (except for a short lag) quite constant throughout the period of disinfection.

With concentrations of ammonia less than one-eighth that of available chlorine (hypochlorite) the chlorine residuals were reduced in proportion to the ammonia present but the nature of the germicide remained unchanged (hypochlorite). With concentrations of ammonia greater than one-fourth that of the available chlorine, the concentration of available chlorine was but slightly altered, but the nature of the germicide was changed from hypochlorite to chloramine.

Doubling the concentration of available chlorine reduced the killing time by approximately 50 per cent and 40 per cent for chlorine and chloramine, respectively.

A drop of 10° C. resulted in a two-fold increase in the period of exposure when employing chlorine and a 3 to 4 fold increase for chloramine, to effect equivalent germicidal action.

The germicidal efficiency of chloramine was not appreciably affected by the presence of a large excess of ammonia at pH 7, but at more acid reac-

tions its efficiency was greater, whereas at more alkaline reactions the killing power was markedly less than was observed for chloramine alone.

At reactions more acid than pH 9.4 chlorine (hypochlorite) was by far the more efficient germicide, but at more alkaline reactions chloramine was better than chlorine.

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Prescriptions for Heavy Cream to be Approved by Health Officers

The War Food Administration has announced the adoption of measures to prevent the abuse of certain provisions of War Food Order 13 with regard to the prescription of heavy cream for use in the treatment of the sick. On June 2, an amendment to the Order was issued which requires that prescriptions for heavy cream be approved "by the public health officer, or the secretary of the county medical society, of the municipality or county" where the patient or hospital desiring the cream is situated.

Housing Problems of Interest to the Public Health Engineer*

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THE Bureau of the Census has reported that there were about 37,325,000 dwelling units in the United States in 1940.[1] Nearly 50 per cent of these were in need of major repairs or lacked inside toilets or baths (Table 1), and 940,000 rural homes had neither a toilet nor a privy. It is evident that a large part of the American public is not served by modern sanitary conveniences.

It has been estimated that apart from replacements there is an average annual need for 500,000 new dwelling units in this country. These would be for newly formed families, and to replace structures destroyed by fire or natural phenomena. Furthermore, 10 to 15 million new dwelling units are needed to replace existing substandard housing. Translated into dollars, this means that at least 40 billions would be required to provide necessary new housing. An additional 5 million housing units should be rehabilitated at a cost that probably would exceed 2.5 billion dollars. Colean has estimated that the country could absorb anywhere from 900,000 to 1,200,000 new dwellings a year in the decade following the war and still be in need of a large amount of repair during the same period.[2]

There are essential differences between housing built in a peacetime program, and shelter for war workers. The former is designed to last for relatively long periods of time, most generally from 25 to 60 years. Planning for it can be leisurely in comparison with wartime standards, and careful attention can be paid to all details. War housing, which is admittedly temporary, generally has to be built in the shortest possible time, with the result that every expedient to prevent delay is grasped. Building materials in wartime frequently are on the critical list, and many are not available for housing. Standards for wartime construction are perforce lower than those considered to be minimal in peacetime.

It is the purpose of this discussion to point out some of the phases of any

TABLE 1

Certain Dwelling Unit Characteristics, 1940

	Urban	*Rural* *	*All*
Millions of Units	23.685	13.64	37.325
Millions needing major repairs or lacking inside toilet or bath	7.085	11.139	18.224
Percentage needing major repairs or lacking inside toilet or bath	29.9	81.8	48.8

* Excluding rural units within metropolitan areas

* Presented before the Engineering Section of the American Public Health Association at the Seventy-second Annual Meeting in New York, N. Y., October 14, 1943.

large scale housing construction and rehabilitation program that should interest public health engineers. Many of the comments stem from the writer's experience during the past eighteen months while he has been detailed by the Public Health Service to be Sanitary Engineer Consultant to the Federal Public Housing Authority.

SANITARY ENGINEERING PROBLEMS

The sanitary engineering problems of housing are essentially those of the community. For this reason it is the policy of FPHA as well as the Federal Housing Administration to use existing public utilities wherever possible. Effective coöperation of these agencies, with the Federal Works Agency and local governments has been instrumental in strengthening the water supply and sewage disposal facilities of many communities. However, the exigency of providing shelter in the shortest possible time has occasionally necessitated the development of on-site water resources or sewage treatment plants. It is with these utilities that health department engineers should have a primary concern.

Reference has been made to the need for rapid development of projects to house war workers. Under the terms of the Lanham Act, the National Housing Administrator is authorized "without regard to . . . any federal, state or municipal laws, ordinances, rules, or regulations relating to plans and specifications or forms of contract, the approval thereof or the submission of estimates therefor . . . to make surveys and investigations, plan, design, construct, remodel, extend, repair, or demolish structures, buildings, improvements and commercial facilities."[3] In order to eliminate all possible sources of delay it has been the policy of the FPHA not to submit plans to state and local authorities for approval. However, the Authority attempts to coöperate closely with all interested state and local officials. In the post-war period, as before the war, public housing will undoubtedly be constructed by local authorities and will conform to all local ordinances and regulations.

WATER SUPPLY

Water is generally provided at large new housing developments for fire fighting purposes, thus assuring a supply that is quantitatively sufficient for domestic purposes. Public health engineers will usually be concerned with questions relating to the safety of the source, the degree of treatment, and the construction and operation of plants and distribution systems, when such facilities are built to serve new housing.

For instance, the FPHA was recently concerned with difficulties in sterilizing water mains at a war trailer project. The supply, taken from a potable source, as it entered the project mains was slightly contaminated. Samples collected from frost-proof hydrants at the extremities of the system showed serious bacteriological contamination. There were no physical evidences of faulty construction, and the system on-site was superchlorinated seven times, with dosages ranging up to 200 p.p.m. of available chlorine. Contact periods exceeded 24 hours. Samples continued to be unsatisfactory. The questions were asked: Should these badly needed trailers be opened for occupancy before there is bacteriological evidence that the water supply is free from contamination? If not, where will the essential war workers in this isolated, crowded community be housed? Is it the state's responsibility to install an emergency chlorinator at this project? Provision was subsequently made for permanent chlorination, thus answering these particular questions. However, they are typical of others that are raised

periodically concerning war housing water supplies.

Arrangements have recently been made with several state health officers to examine water samples collected by FPHA project managers. In at least one state, samples are routinely collected by health department representatives from housing projects served by FPHA-owned water supplies. Do health department engineers regularly arrange for this service for privately built, multiple-unit housing developments served by other than public water supplies?

In some states, builders are required to submit plans for the development of on-site water supply and sewage disposal facilities to the state health department for review and approval before construction begins. This is a desirable practice and should be universal.

SEWAGE AND REFUSE DISPOSAL

Health officials are constantly confronted with problems arising out of the disposal of sewage from dwellings located in areas where sewers are not available and cannot be justified. If housing developers consulted appropriate health authorities when selecting sites *and* if health departments were prepared to review all plans for and supervise the installation of on-site sewage disposal systems, most of these problems would never arise. However, until public health engineering services are more generally provided, it is evident that sewage nuisances will occur frequently. This is particularly noteworthy in light of the sewage disposal needs expressed above.

The collection and disposal of refuse from suburban and small town homes present particular difficulties. It would doubtless be possible to establish satisfactory refuse disposal systems in many places where extensive housing is built, if public health engineers could cooperate with housing officials during the housing development stage as is the case now with FPHA projects. It has been evident in many war-boom areas that the lack of a suitable local catalyst has prevented the crystallization of a refuse disposal system. Conversely, competent local sanitarians have stimulated the organization of satisfactory wastes disposal schemes in several places.

STRUCTURAL PROBLEMS

Outmoded and highly restrictive plumbing legislation may seriously interfere with the extension of decent indoor sanitary facilities to tenants of low rent housing. Connolly has pointed out the important factors to be considered in designing plumbing for low cost housing,[4] and a subcommittee of the now defunct Central Housing Committee has developed a comprehensive plumbing manual for use by federal construction agencies.[5] Plumbing codes generally should be brought up to date, both to protect the public health and to permit uses of materials which will give better and more lasting plumbing. Unless many city plumbing codes are modernized it is likely that progress in providing inside plumbing in the thousands of structures that are otherwise rehabilitable will be seriously impeded if not entirely blocked.

During the present national emergency it has been necessary to lower plumbing standards for temporary housing.[6] However, an attempt was made to preserve those parts of codes devised to protect the public health.

New and existing houses in many American communities should be ratproofed. There is an adequate economic reason for doing this, and in many places the hazard of rodent-borne disease is serious. Private builders probably will not plan for rat proofing if official pressure is not exerted by the health department.

The Royal College of Physicians of London has recently drawn up a memorandum entitled *"Design of Dwelling Houses"* that contains much interesting information concerning desirable structural characteristics for homes.[7] Furthermore, the document reveals the need for intensive research, much of which would involve physical and physiological studies that cannot readily be conducted under state and local health department auspices. However, studies of the technics of housing sanitation might be carried out by engineers attached to such agencies.

APPRAISAL OF URBAN HOUSING NEEDS

Many of the needs for new housing are bound to be met in the post-war decade. The slum clearance and public housing work of the 30's will doubtless be continued with new vigor, as will the extensive private home building program that is so much a part of America. In addition, the elimination of temporary war housing projects will involve considerable work.

It is essential that careful planning for new housing be conducted on federal, regional, and local levels. The National Housing Agency, parent organization of FPHA and FHA, is logically concerned with national planning. Equally responsible for local planning are town, city, and county governments. The time to do that planning is now.

In order to do successful planning, specific data on housing needs should be available.

A useful technic for studying the quality of urban housing, and indirectly the need for new construction and for the rehabilitation, has been developed by the Committee on the Hygiene of Housing of the A.P.H.A.[8] It has been tested in New Haven, Stamford, and Waterbury, Conn., and in Portland, Me., and is ready to be applied elsewhere.

The committee believes that health officers should take an active part in planning housing for health.[9] It is desirable in studying housing needs, to have close collaboration between health workers and other local officials, including housing authorities and city planning experts. The appraisal technic of the Committee on the Hygiene of Housing appears to be the most effective tool yet devised for this purpose.

The cost of a housing survey using the technic mentioned above is low. Complete data on 1,280 dwelling units in New Haven were collected and processed at an expenditure of 4 man-months of inspectors' time and between 3 and 4 months' time of one clerk.[8] This would be at a rate of approximately $.80 per dwelling unit. Considering the value of the data for planning for new housing, the rehabilitation of existing homes, and the development of a satisfactory housing inspection program, this is a low unit cost. The appraisal technic can be applied on a sampling basis in known substandard areas, thereby further limiting the total expenditure for any given community.

No health department can afford to carry on without planning and expect to make progress. The objectives of any health program must be clearly understood. It is reasonable to expect that future housing inspection work conducted by health agencies will involve not only consideration of minor structural and maintenance problems, but also broad questions of slum clearance and rehabilitation. It is axiomatic that the first job of a new health unit is to conduct a reconnaissance survey. Why not a similar study of housing?

COÖPERATION BETWEEN HEALTH AND HOUSING AGENCIES

It has been charged that the builders of housing are uncoöperative and fail

to seek competent technical assistance from health departments. This comment unfortunately contains an element of truth.

However, there is another side to the story. Health departments have not always been able and willing to give good technical guidance to the housing construction industry. There is too often a tendency for "health authorities" to tell the public what to do without saying how to do it. Housing is a big business. Its representatives are generally willing to be guided by competent technicians. But it wants guidance of a positive nature.

Some health officers have been mistaken in considering that FPHA projects are government reservations and therefore not subject to health department inspection and supervision. This assumption is wrong, and the Authority is on record as requesting the services of public health agencies in many communities.

Adequate control of housing from the viewpoint of public health requires many forms of protection.[10] Standards for new construction and the rehabilitation or conversion of existing structures are essential. Maintenance and occupancy standards must be enforced. But it is practically impossible to accomplish much in the improvement of housing in a community unless there are satisfactory housing regulations. Health, building, and other officials need authority to make a frontal attack on the numerous problems that confront them all. Such authority usually will result only from the enactment of a local housing code.

The development of modern housing regulations in every locality should be among the first pieces of work of health departments in the post-war years. Public health engineers should be vitally concerned with the content of such legislation, and they have a responsibility to promote it.

DUTIES OF HEALTH DEPARTMENT HOUSING ENGINEERS

The Public Health Service has been coöperating closely with FPHA ever since that agency was created by Executive Order on February 24, 1942. At present, 11 engineers are on full-time detail to FPHA from the Service. One is on duty in the Central Office, and there is also one in each of the ten regional offices of the Authority. These sanitary engineer consultants are concerned with all manner of environmental sanitation problems occurring in war housing. It has been their experience that, if there can be effective coöperation during the development of plans and the selection of sites for multiple-unit housing, many of the sanitation problems that might develop are automatically prevented. Probably the most significant contribution of these men is made in connection with the selection of sites.

The idea of detailing health department engineers full-time to housing work is not new. The Connecticut State Department of Health has had a housing engineer in its Bureau of Sanitary Engineering for several years.

The duties of a housing engineer in a state department of health involve:

1. Analysis of existing housing laws and regulations with a view to the development of new legislation for state and local enactment
2. Training of local public health engineers and sanitarians in modern housing inspection technics
3. Assisting in the organization of local housing surveys
4. Review of plans for major new housing developments (particularly in communities lacking local health services)
5. Consultation with governmental officials and citizens concerning housing sanitation

These are time-consuming jobs. However, they strike at many of the roots of our housing problem, and for that reason are essential.

There is little evidence at present

that city or county health departments would be justified in employing housing engineers as such, except in the largest communities. However, there are numerous opportunities for local public health engineers to concern themselves with housing. These include (in cooperation with public housing officials and private home builders):

1. Development of a satisfactory housing code
2. Organization of a comprehensive inspection program including a plan for evaluating the need for new housing and for the rehabilitation of existing structures
3. Review of plans for new construction
4. Inspection of new construction, particularly of sanitary facilities being provided therein

These duties are obviously important, but they have not always been given the attention due them. It is to be hoped that in the post-war world public health workers will assume their responsibilities in these respects, and that they will take positive action to promote housing for health.

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Further Evaluation of EC Medium for the Isolation of Coliform Bacteria and Escherichia coli*

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AT the St. Louis meeting of the American Public Health Association in October, 1942, the authors had the pleasure of discussing their experience with a new EC medium (buffered tryptose lactose bile-salt †) for the isolation of coliform bacteria at 37° C. and of *Escherichia coli* at 45.5° C.[1] In the examination of 147 samples of drinking water of various types, not a single false presumptive was encountered among 1,176 gas tubes while 58.5 per cent of false presumptives were obtained with standard lactose broth. At the same time 14.2 per cent more of the EC tubes were positive for coliforms. The medium was found to have comparable sensitivity to Mallmann and Darby's[2] LST (lauryl sulfate tryptose) medium when tested with 33 stool specimens and 25 samples of raw sewage.

Evaluation of the medium in laboratories other than that of the authors, seemed desirable. However, due to war conditions many laboratories were unable to participate in such an evaluation. Results are presented here from eleven laboratories including that of the authors. Some results from the participating laboratories have had to be excluded because of technical errors.

The completed test for coliform bacteria was used in this study. It is well known that the more steps involved in a routine examination, the greater the number of errors, and it is probable that some of the results presented here are highly inaccurate due to such technical errors. If the short confirmatory procedure of transferring a loopful of culture from the primary gas tube to a secondary tube of brilliant green bile broth had been used, such errors would probably have been largely eliminated and a far better evaluation of the several media might have been obtained. The good results obtained in some laboratories indicate the potential values of these media.

It appears that in actual routine work an unconfirmed presumptive test with either the EC medium or the LST medium is probably much more reliable than the standard completed test. The use of a single primary medium such as EC or LST as a completed test would be valid, however, only if gas resulting from actual fermentation of lactose is recorded. With both these media abundant gas is almost invariably present within 24 hours if positive for any bacteria of the coliform group. Slight traces (less than 1 per cent) of gas in these two media without

* Presented before the Laboratory Section of the American Public Health Association at the Seventy-second Annual Meeting in New York, N. Y., October 13, 1943.

† "EC" refers to *Escherichia coli* though the medium is just as valuable for isolation of coliform bacteria at 37° C. as it is for the isolation of *Esch. coli* at 45.5° C.

effervescence are probably nonspecific gas, for it is well known that such traces of gas may result from various nonspecific causes. It is a routine practice in the authors' laboratory to test for questionable gas by shaking. If definite fermentation of lactose has occurred, effervescent gas will be very obvious. Slight traces of gas have never been found by the authors in either EC medium or LST medium after 24 hours' incubation unless slow lactose fermenters are present. Whenever coliform bacteria have been present, abundant gas has been produced. Slight traces of nonspecific gas without effervescence do occur in some laboratories for the reasons noted. Such traces of nonspecific gas can usually be avoided by suitable technical precautions and their nonspecific nature determined by shaking. Traces of gas, however, should always be confirmed.

In order to show the wide variations in results obtained by the participating laboratories, the results were separately compiled. The results also were compiled according to the type of material under examination. In accordance with our earlier report,[1] very few false presumptive tests were obtained with the EC medium by bacteriologists in five of the participating laboratories (A, B, C, D, and E). Only six, or 0.6 per cent, false presumptives were found among 945 EC gas tubes. It is doubtful, however, if the six so-called false presumptives were really false, as slow-lactose-fermenters were recovered from two similar tubes and possibly were present in these six tubes had they been available for critical reëxamination. The results with the LST medium were also excellent. With the same samples, 654 LST gas tubes were obtained against 650 with the EC medium. There were no false positive EC gas tubes, however, while 15, or 2.3 per cent. were found with the LST medium. False "false presumptives" due to slow-lactose-fermenters, could be expected to be the same with both media. The percentage of false presumptives using standard lactose broth (SLB) varied from 0 to 97.9 per cent and averaged 24.2 per cent.

No evaluation of the lauryl sulfate medium at 45.5° C. was attempted but the EC medium was found highly specific for *Escherichia coli* at this temperature. While a small percentage of false presumptives was encountered with the authors' original modified Eijkman medium,[3] only one, or 0.17 per cent, out of 603 EC gas tubes obtained at 45.5° C. failed to confirm for *Escherichia coli.*

Unfortunately, the results from six other collaborating laboratories (F, G, H, I, J, and K) were not so satisfactory. The percentages of false presumptives with Laboratory "F" were small for both the EC and LST medium and relatively small for SLB. Laboratory "G" found relatively low percentages of false presumptives with all three media and the sensitivity of the EC medium was considerably lower than that of the LST or SLB. Laboratory "H" tested all three media on samples of shellfish and of raw and chlorinated water. It is stated in the report from that laboratory that "the adoption of the LST medium as the standard medium would result in coliform indices somewhat larger than at present with SLB and that the use of the EC medium would effect a sharp reduction in the number of false presumptives." The following data have been presented by that laboratory after they had deleted certain questionable samples.

Medium	*Primary Gas Tubes* *	*Completed Test* *
SLB	9.7	4.6
LST	6.7	4.7
EC	4.7	4.4

* as M.P.N. per sample

These computations obviously were not made from the data as presented in this

report, which had from 11.3 to 24.4 per cent false presumptives for the EC medium and from 6.8 to 24.1 per cent for the LST medium. Those for standard lactose broth varied from 13.8 to 56.0 per cent. Significant data were selected.

Detailed results for each of the participating laboratories have been deleted on account of space. A summary of the results from all of the participating laboratories is given in Table 1.

TABLE 1

Comparative Sensitivity and Specificity of EC, LST and SLB Media for the Isolation of Coliform Bacteria

(Condensed Table)

Material, Samples and Tubes	Medium	37° C. Incubation: Coliforms: Gas Tubes	Coliforms: No. Pos.	Coliforms: Per cent False Presump.	Esch. coli: No. Pos.	45.5° C. Incubation: Medium	Tubes Inoc.	Gas Tubes	Esch. coli	Per cent False Presump.
				Laboratories A, B, C, D, E						
*	SLB	1,117	847	24.2	620	ME	1,265	600	588	0.3
S 711 T 4880	EC	945	936	0.6	728	EC	1,265	603	602	0.17
S 379 T 2790	LST	654	639	2.3	506					
				Laboratories F, G, H, I, J, K						
†	SLB	1,509	1,253	15.0	127	ME	198	130	109	16.2
S 284 T 2436	EC	1,390	1,210	13.0	123	EC	198	122	101	17.2
S 259 T 2236	LST	1,383	1,178	14.8	116					

SLB = Standard Lactose Broth
LST = Lauryl Sulfate Tryptose
ME = Modified Eijkman
* Samples of human feces, shucked oysters, milk, sewage, and various types of water
† Samples of shellfish and various types of water

The reason for the high percentages of false presumptives obtained by some of the collaborating laboratories may be due to reading tiny bubbles of air or nonspecific gas as "positive" when there is no fermentation of lactose. Such traces of gas are apt to be entrapped air or that resulting from dextrose formed by hydrolysis of lactose. Air may be forced into some tubes when running water from pipettes. Dr. Black's report [4] on technical errors in the bacteriological examination of milk indicates how widespread technical errors may be. Technical errors are doubtlessly as widespread in water examinations. The impossibility of evaluating any method unless technical errors can be controlled, is obvious. It is hoped that further work may help to determine the validity of these results and the exact cause of probable technical errors.

CONCLUSIONS

The results indicate to the authors that both the LST medium and the EC medium are highly sensitive and specific media for the isolation of coliform bacteria from water, shellfish, and sewage. The EC medium has also given excellent results for isolating both coliform bacteria at 37° C. and *Escherichia coli* at 45.5° C. from milk. If errors probably due to reading gas resulting from entrapped air, hydrolysis of lactose, and often other factors can be eliminated, positive presumptive tests with both the EC medium and the LST medium have been found to be indicative of the presence of coliform

bacteria in almost 100 per cent of cases. While both the EC and LST medium are highly efficient in the isolation of coliform bacteria, the EC medium is somewhat more specific. A presumptive test reading with either the EC or the LST is obtainable which seems to be far more dependable than the usual "confirmed" or "completed" test result. Both of these media offer rapid tests of great dependability which should be of the utmost importance under war conditions and in peacetime for, when properly performed, they give highly dependable results within 24 or, at most, 48 hours.

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ACKNOWLEDGMENT—The authors wish to thank the Difco Laboratories for making available the dehydrated EC medium for this evaluation.

Industrial Hygiene in the Post-War World*

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THERE can be no doubt that the war has set the stage for a new industrial era in the United States when hostilities shall have ceased. By the same token, we can clearly envision a new era of industrial hygiene in the post-war world. I am well aware that the phrase "new era" carries, somehow, a meaning of promise and optimism. But "newness" in itself never has connoted a change for the better. Post-war industrial hygiene will be just what we make it—an effective tool for the advancement of human health and welfare or solely a specialty of scientific research and medicine.

We are now at the flood-tide of war production. The industrial plant of the United States and our labor force are the largest in the world's history. Within the limits of available funds and trained personnel, the nation's industrial hygiene services both public and private have reached their peak of performance.

From this vantage, what can those of us—equipped by training and experience to anticipate problems and needs in industrial health—visualize as our future task? How can we best meet the problems and needs? Where do we go from here?

The answers to these questions are found in joint planning on the part of all interested groups, under the leadership of those with the "know-how." But unfortunately, at a time when we most need concerted thought and action, post-war planning has become more or less a free-for-all. Diverse plans are being placed before the public, and various writers in various occupations have submitted schemes for the world of tomorrow. This being the case, I do not hesitate to enter the arena, for although any public servant nowadays expects to be dubbed "bureaucrat," I have not yet been called a "long-haired professor," and hence may be allowed to speak my piece.

DEFINING THE PROBLEM

Reliable estimates of the need for industrial hygiene services depend upon our ability to define the problem in every area of operations—plant, community, state, and nation.

At the present time, reliable data in the industrial hygiene field are scant. For example, our estimates of disabling sickness among the nation's workers and the trends in occupational morbidity and mortality are based upon a very small sample. The records submitted to the Public Health Service for analysis cover some 250,000 individuals employed in a limited num-

* Chairman's address presented before the Industrial Hygiene Section of the American Public Health Association at the Seventy-second Annual Meeting in New York, N. Y., October 12, 1943.

† Since this paper was prepared, the Division has become the Industrial Hygiene Division, Bureau of State Services, U. S. Public Health Service.

ber of trades. These studies constitute the best available estimates of industrial disability and are of great value in demonstrating the methods of disability reporting and analysis.

Occupational disease reporting in the United States is so inadequate as to be worthless. Twenty-five states have laws or regulations or both relating to occupational disease reporting. Other sources of data are the 27 bodies administering the various state compensation laws. But since these laws vary in coverage and in other particulars, the diseases reportable and the methods of reporting vary to such an extent that at present no comparable data can be assembled. If we are to have the epidemiologic intelligence needed in attacking any public health problem, the states will have to come to some agreement on uniform reporting of occupational diseases and will have to enact appropriate legislation.

The compilation and analysis of data on disabling sickness and occupational disease require the attention of statisticians skilled in the interpretation of mass data. Here the state vital statistics bureau or the state division of statistical services could be of enormous help to governmental industrial hygiene units and industry by providing good statistical services. This is being done with considerable success in connection with disabling sickness by the Tennessee Division of Statistical Services, a unit of the State Department of Public Health. Although the work began with a sample of industrial plants in the state, the results in valuable information on the how, when, and where of industrial disability have been such as to require an expansion of the service.

The economics of industrial hygiene is one of the most important and most neglected areas of information. There are no data available on the *total* national expenditures by all sources for industrial health and safety services. Estimates have been made of the costs of in-plant services and a few interested industries have attempted to correlate costs of services and savings in costs of compensation, time loss, labor turnover, etc. Much work needs to be done in this field. Industry and labor, insurance companies, and governmental agencies all have a stake in the development of more complete information on industrial hygiene economics. Further expansion depends heavily on our ability to estimate the practical benefits of industrial hygiene. Better information on the costs of services might lead to the development of more effective utilization of funds, facilities, and personnel, and hence to important savings and better services.

If then, war's end presents no new problems, reëvaluation of the industrial hygiene problem, improvements in epidemiologic information, and the collection and analysis of data on the costs of industrial hygiene offer a stimulus to greater effort.

POST-WAR PROBLEMS

The cessation of hostilities, however, will accentuate rather than reduce the need for industrial hygiene facilities. Although we have learned much about many of the new materials introduced during the war and scheduled for much wider use in consumer production, we will be faced with the potential hazards of entirely new processes, new types of jobs, and still newer materials.

Proper placement of workers returning from the armed forces or from war industries will be of outstanding importance, especially in relation to service-connected disabilities. We have only made a beginning in the effective adjustment of handicapped persons to industry. This war cannot be followed by blanket rejection of the physically handicapped from industrial employment. It is the responsibility of

industrial hygienists to see to it that jobs are fitted to men and men to jobs.

The U. S. Civil Service Commission has made a careful job analysis of some 2,500 occupations to determine the jobs for which service men with varying types and degrees of disability could be trained. It is expected that the findings of the study will be utilized by national and state rehabilitation services and by industry in the selection, placement, and reëducation of disabled service personnel.

Threshold training of new workers by industry and educational institutions has been introduced during the war as a means to provide quickly the all-essential man power. In the reëducation of former workers and the training of service men for industrial employment, this same method of job instruction will be used on a wider scale. Here, industrial health and safety personnel can exercise a powerful influence by introducing concurrent training in safety practices and in the recognition by supervisory personnel of potential hazards. Plans for integrating industrial hygiene with post-war vocational education and rehabilitation should be made now.

Demobilization of our armed forces and of war industries will result in an even more drastic and acute transmigration of workers and their families, with attendant social and economic dislocations that will augment the problems of medical care, particularly as it relates to industrial hygiene.

Already plans are being advanced by industry for the conversion of war establishments to consumer production. As in conversion to war production, health and safety of the workers must be considered at every stage of the transition—from the blueprint to full operation.

New industrial hygiene problems will be posed by pre-war industries now grown to giant size, and destined to find a comparable place in the peacetime economy. Notable in this group is air transport. Much that we have learned in creating our superb United States air force can be applied to post-war aviation. But problems as yet unsolved and others anticipated will require intensified research and application of new knowledge. For example, civilian aviation and air transport will not only bring in the "air age," but also airplane accidents. While aeronautic engineering and plane production have advanced consistently in solving the problems of mechanical failure, we know very little about the human factor in airplane accidents. The selection of flight personnel, pilot fatigue, air sickness, and the physical fitness of personnel, passengers, and civilian fliers for flight—all need study. In the post-war world, these problems of aviation medicine have industrial hygiene implications that cannot be overlooked

Other industries and processes have come out of the laboratory during the war and will be important in post-war industrial hygiene. The manufacture and processing of plastics and synthetic rubber on a large scale are here to stay. So also are welding and fabrication of light and heavy metals, x-ray inspection of industrial materials, and a dozen others. Each of these new technologies presents potential hazards of a serious nature which must increasingly demand our attention as their use expands.

The substances used in the manufacture and processing of synthetic products have been under investigation by the Division of Industrial Hygiene, National Institute of Health, for some time. Likewise, rare metals such as beryllium which have hitherto been little used in industry are still under study. As similar substances come into wider and *newer* use, research must continue and large-scale application of control methods must be envisioned in

post-war industrial hygiene work. Both industry and government should plan together now how present knowledge may be applied to consumer production.

Furthermore, developments in the post-war industries will undoubtedly see the introduction of new substances and processes. Close coöperation between industry and governmental industrial hygiene services is needed in order to eliminate the lag between the introduction of new potentially hazardous substances and the determination of their toxicity and of control measures.

The pressure of war production has made it impossible in many cases for industry to apply control measures before outbreaks of occupational disease occurred. If industrial hygiene is brought in on the ground floor of planning for post-war production, much needless human waste can be prevented.

If an industry knows that a new substance or a new process is to be important in its post-war program, now is the time to subject the problem to industrial hygiene investigation. Within the last year, the munitions industry profited by securing this type of foreknowledge. When there were only a few pounds of a new explosive in the United States, laboratory research in the Division of Industrial Hygiene and the War Department determined the toxicity and defined the control measures for the safe large-scale use of the explosive. Obviously, this method affords important economies both in the installation of processes and in the prevention of disability.

Governmental industrial hygienists may well anticipate in the post-war period, if not before, the added responsibility of occupational disease and accident control in agriculture. Although some work has been done on the health and safety problems of agricultural workers, the field remains virtually untouched. Should these workers be brought under the provisions of the Social Security Act, a further expansion of state and local industrial hygiene services will be essential.

We have not yet considered the means with which we are to meet the post-war problems of industrial hygiene. This is a problem in itself. First in importance is the dearth of professional and technical personnel. The specialty of industrial hygiene had scant attention in our medical and engineering schools before the war. Postgraduate training in the professions has already suffered more than we realize as a result of war. One of the most serious responsibilities facing us today is the training of young physicians and engineers who have gone directly from school to the armed forces and who are not prepared to give industrial hygiene the transfusion of new blood it must have. Although some postgraduate training of nurses is being done, the vast majority of the young women now being trained in the U. S. Cadet Nurse Corps will go into bedside nursing. Their absorption into public health and industrial nursing after the war depends upon our ability to give them the training essential in these specialties.

The training of other professional personnel, technicians, and sub-professional workers for industrial hygiene service offers a similar challenge. There will be many competent young men and women returning from our armed forces who are accustomed to the development of skills and to discipline. We should begin now to plan intensive training in industrial hygiene, not only for the physicians, engineers, chemists, and nurses, but also for the technicians and other personnel who will be needed.

It is not too soon for official and nonofficial industrial hygiene services to approach the educational institutions with a view to the establishment of training facilities. Under the pro-

visions of Title VI of the Social Security Act, the U. S. Public Health Service before the war developed with numerous universities a program for the public health training of state personnel. Due to the lack of educational facilities, little specific training in industrial hygiene could be done. When the war is over, we should be in a position to write a strong industrial hygiene education plan into the public health training program. The establishment of new facilities in existing schools of engineering and medicine would not only service personnel of official agencies but would attract students destined for employment in industry.

FINANCING INDUSTRIAL HEALTH SERVICES

Those industries which have established adequate in-plant health and safety services, I am confident, will continue and even expand the facilities as needed. It is in such plants that we find the practical demonstration of the best that industrial hygiene has to offer. This group is still woefully small, a microcosm in an industrial establishment so large that it already staggers the imagination!

The large group of small plants in the United States probably cannot afford individual in-plant services, but can undoubtedly be interested in any practical plan for the joint utilization of a central community industrial health and safety service. The majority of plants in all size groups, however, do not have in-plant services and appear content with perfunctory compliance with the minimum requirements of workmen's compensation laws.

Nevertheless, a good proportion of the industrial establishments in this country, and the labor unions, too, have learned more about industrial hygiene in the past two years than they ever knew before. Management and labor, then, are the sources from which demands for more services will come, and I am sure the demand will continue—in crescendo.

I do think, however, that any substantial real expansion of industrial hygiene work in the future depends upon certain eventualities. First, if management, labor, and the government acquire a larger financial stake in workers' health and safety, obviously increased facilities will be demanded, both within the plant and in consultant and technical services. There is now before the Congress legislation which would provide health insurance for workers covered under the Social Security Act. If this or similar legislation is passed, the three contributors to the insurance plan will insist upon adequate preventive services to reduce time loss due to disability.

Further legislative action with respect to the health and safety of industrial workers should be on the post-war agenda of the states, management, and labor. Legislation requiring minimum safeguards against occupational hazards is still inadequate in certain states. The inspection forces are not sufficient to detect every case of non-compliance with existing laws. In order to equalize the hazards to workers and the costs to industry throughout the country, adequate legislation and adequate services are essential in every state.

Another factor contingent to the expansion of industrial hygiene is the participation of state and local governments. Have they been participating enough? The record is clear. For the fiscal year 1943–1944, state and local industrial hygiene services have budgeted $1,225,000 from all sources. Of this total, 49.8 per cent is in federal funds. An additional $209,000 was budgeted in salaries of personnel loaned by the Public Health Service under the Emergency Health and Sanitation Appropriation. Thirty-five state health

departments contributed a little over one-fourth, or 27 per cent. Two state departments of labor budgeted 13 per cent of the total, and 10 local health departments contributed slightly over 10 per cent.

Industrial hygiene services in 7 states are financed this year entirely by federal funds, and 8 others receive from three-fourths to over 90 per cent of their funds from the same source. Thirteen other units derive from one-half to three-fourths of their budgets from federal funds. Thus, in 60 per cent of the 47 existing governmental industrial hygiene services, the major cost is borne by the federal government. It should be said, in all fairness, that this record is a considerable improvement over that in the years immediately following the passage of the Social Security Act, or even over that of last year.

These expenditures are all exclusive of salaries of Public Health Service personnel assigned to state units under the Emergency Health and Sanitation Appropriation, as already stated. However, we must not lose sight of the fact that the Emergency Health and Sanitation program is limited by the duration of the war and 6 months thereafter. It is important, therefore, that the states include in their post-war plans the taking up of this deficit.

These facts make clear the pitifully small effort for the health and safety of our industrial population both before and during the war. No one thinks for a moment that American industry will be reduced to its pre-war stature even after the post-war transition to consumer production. Certainly, the future promises a period of industrial activity greater than at any time in the ten years preceding the war. Some of the nation's most influential industrialists have stated frankly that the present and future problems of production are not in engineering and operations, but are human problems—how to increase the efficiency and promote the well-being of the men and women whose stake in modern industry is their labor. The provision of adequate health and safety services is the first step toward realizing that goal.

The service rendered by state and local industrial hygiene units is the spear-head for the future advance of industrial hygiene. I will go further. It is the spear-head for the future advance of public health. Aside from the need for specialized services in the control of occupational diseases and accidents, the industrial hygiene program offers the channel for the ultimate control of such long-fought diseases of public health importance as tuberculosis and venereal disease; for the advancement of public health dentistry; and adult hygiene in general.

Governmental industrial hygienists at every level are well aware that state and local governments are not meeting their industrial hygiene responsibilities. Lack of funds has often been given as an excuse. But is it not possible that a little thought, a little better planning of budgets, and a real effort to inform local health officers and appropriating bodies might bring to light enough money and enough elbow-grease to strengthen industrial hygiene services?

There are no non-industrial states in the United States. The war has industrialized many areas hitherto entirely rural. Yet, 10 states still have no industrial hygiene services whatsoever.

The present minimum staffs in the 38 states having such services must be strengthened, and because of the wide dispersion of industry it is desirable to decentralize services in industrial hygiene at district, city, and county health department levels.

These are important pieces of unfinished business which the public health movement must complete, either now or after the war. Failure to do

so will mean that public health has missed its great chance to serve as a leader in the promotion of national well-being.

INTERNATIONAL RELATIONS IN INDUSTRIAL HYGIENE

After the war, the reconstruction of occupied territories, the transition from war production to a peace economy in the United Nations, and the expansion of industry in backward countries will present innumerable industrial hygiene problems best solved by an interchange of knowledge and skills. Any plans for post-war rehabilitation should include plans for industrial health and safety. The industrial hygienist should be given the same responsibility in national and international programs for the promotion of workers' health as has been given to public health and medicine in the United Nations' plan for the improvement of human nutrition.

Industrial hygiene in the post-war world has a magnificent opportunity to advance human health and welfare through the application of the knowledge and experience gained during the war. Those of us who have shared that experience should begin now to project our thoughts into the future and consider how best we can serve in the post-war world—for it will be a world of work.

Proposed Report on the Educational Qualifications of Medical Administrators of Specialized Health Activities*

Considered in This Report Are the Following Specialized Activities: Maternal and Child Health, Control of Tuberculosis, Venereal Disease, Cancer, Mental Hygiene, and Industrial Hygiene.

AMONG essential health services are specialized activities, that is, activities designed for the control of individual diseases or groups of diseases, and for safeguarding and promoting the health of selected population groups. All such activities are concerned with the large scale application of highly technical medical knowledge; all of them include the continuous observation of many individuals over long periods of time, and all of them require the use of numerous facilities in the health agency and elsewhere in the community. Each specialized activity calls for a medical administrator who is a physician qualified both in his particular line of work and in the general field of health administration. For many years maternal and child health programs and services for the control of tuberculosis, syphilis and other venereal diseases have been organized as separate units in health agencies of any considerable size. Specialized activities more recently organized similarly include those for industrial hygiene, mental hygiene, and the control of cancer, and it is to be expected that additional new undertakings will be placed in the same category. Duties and functions, and educational and personal qualifications common to medical administrators of all specialized activities will first be presented in this report, followed by a summary of desirable postgraduate clinical training and experience in each field.

The duties of the medical administrator who serves under the general direction of the health officer include participation in clinical activities to a greater or lesser degree depending upon the size of his medical staff. Even in large organizations, he serves as a consultant, and in smaller agencies he serves as a clinician and takes part in diagnostic and treatment activities. He also is responsible for securing the coöperation and assistance of the medical profession and for judging the effectiveness of clinical procedures in force and the efficiency with which they are carried out. The medical administrator is responsible for changing clinical and other activities so that they comply with the best modern practice, and he must be capable of taking advantage of new discoveries of public health importance. He has opportunity for research of his own and of inaugurating special studies and research for the members of his staff.

* The Committee on Professional Education of the American Public Health Association publishes this report before transmittal to the Governing Council in order to permit the members and Fellows of the Association to review it and to offer criticisms and suggestions in the further consideration of the report. It would particularly welcome suggestions as to the amplification of the various specialties included in the report.

This report, like all other statements of the committee on professional and technical qualifications in public health, is subject to periodic revision in order that it may be kept abreast of the best thought.

Specialized health activities all require the establishment and maintenance of systems of reporting and of registers for keeping patients and their associates, and other classes of individuals under continuous observation. The medical administrator's duties include supervision of those record systems and responsibility for the character and quality of data collected in them. Such data largely result from clinic and field services. Most important among the latter are services rendered by public health nurses. It is the duty of the administrative officer to formulate definite policies for home visiting and other public health nursing activities in his field. Control measures for diseases under the heading of special activities and for promoting the health of selected population groups are by no means limited to those administered by the director of a given activity. The medical administrator uses numerous health department facilities, such as laboratory services, those in health education, in environmental sanitation, and in special activities other than his own. His duties include a thorough understanding of related work done by other agencies, official and voluntary, and he may advise or assist in programs besides those in the health agency to which he belongs.

The staff of units for special activities in large organizations usually includes several physicians, and there may be a number of full-time positions under such titles as assistant director and clinical consultant. Natural lines of promotion are from those subordinate positions to that of medical administrator. Qualified physicians with full-time administrative experience in smaller agencies are to be considered eligible for higher grades of positions in larger organizations. Part-time physicians are frequently employed in specialized activities to serve in clinics and for other technical purposes. As a rule these physicians have few, if any, administrative duties, and are not to be regarded as qualified for medical administrative positions until they have had the necessary public health training and experience.

PERSONAL QUALITIES

The medical administrator of specialized activities should have the same personal qualities that make for success in other administrative positions. He should, in brief, possess such personal characteristics as adaptability, common sense, creative ability, good health, judgment, leadership, and pleasing personal appearance.

EDUCATIONAL BACKGROUND

Basic educational qualifications for medical administrators of specialized activities are the following:

1. Fundamental training in the sciences and humanities at least equivalent to that required for a college degree in the arts and sciences
2. Completion of a course leading to the degree of Doctor of Medicine in an approved medical school
3. Interneship of at least one year in an approved general hospital
4. Eligibility to examination for medical licensure in the state where service is to be rendered

GRADUATE TRAINING AND EXPERIENCE

Graduate clinical training and experience in each special activity under discussion are summarized below. Practical considerations sometimes demand that graduate training in the special activity be combined with training in public health. The following statement takes this fact into account, but it is preferable for the medical administrator to have the requisite amount of clinical training before enrollment in a public health course.

1. Completion of a program of study [1] of not less than one full academic year in a university leading to a degree in public health.

Such a program should cover the general field of public health: administration, biostatistics, environmental sanitation, epidemiology, health education, laboratory methods, public health nursing, and should be accompanied by special instruction in the application of the basic principles learned to the functions and duties of the medical administrator's special activity, and, if necessary, instruction in the clinical features of the activity.

2. Experience in general administration or in a subordinate position is desirable for all medical administrative positions.

REFERENCE

1. See "Memorandum Regarding Minimum Educational Facilities for the Postgraduate Education of Those Seeking Careers in Public Health," prepared by the Committee on Professional Education, American Public Health Association and published in the *American Journal of Public Health*, May, 1942.

SUMMARY OF GRADUATE TRAINING AND EXPERIENCE IN SPECIALIZED HEALTH ACTIVITIES

The following summaries present desirable graduate training and experience for career service in the administration of specialized activities. Recognition is given to the fact that long clinical experience and distinguished service in the special field may take the place of formal training in an institution or hospital.

MATERNAL AND CHILD HEALTH

Two years of graduate training in pediatrics or obstetrics or both; part of the candidate's experience should preferably be in the administration of a program under supervision.

TUBERCULOSIS

Two years' graduate training in tuberculosis in an approved tuberculosis sanatorium or hospital, or equivalent training in an outpatient service; part of the candidate's subsequent experience should be in the administration of a tuberculosis program.

VENEREAL DISEASE

Two years' graduate training in the diagnosis and treatment of venereal diseases in an approved hospital, or outpatient service; part of the candidate's subsequent experience should be in the administration of a venereal disease program.

CANCER CONTROL

Two years' graduate training in the diagnosis and treatment of cancer, including training in the pathology of the disease.

MENTAL HYGIENE

Two years' graduate training in psychiatry in an approved mental hospital, and one year's experience in outpatient work with children in a clinic employing the integrated services of psychiatrist, psychologist, and psychiatric social worker. Desirable supplemental experience includes clinical neurology, service in institutions for epileptics, mental delinquents, and defectives, and neuropathology.

INDUSTRIAL HYGIENE

Clinical graduate training for medical administrators in industrial hygiene may be in the field of industrial toxicology and in the diagnosis and treatment of occupational diseases. The medical administrator should have good knowledge of physiologic problems, and he should be trained to serve in directing rehabilitation services for the handicapped and in the technics of accident prevention and safety. Training and experience are best secured by service in an industrial plant.

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The Cuban Government Honors General Simmons

On May 17, at the invitation of the Cuban Government and Dr. Alberto Recio, the Minister of Health, Brigadier General James Stevens Simmons, Chief, Preventive Medicine Service, Office of the Surgeon General, U. S. Army, visited Havana and took part in the dedication of the new National Institute of Health. During the ceremonies President Batista decorated General Simmons with the Medal of the Carlos J. Finlay National Order of Merit in the grade of *Gran Official*. The President also sent by General Simmons to Major General Norman T. Kirk, the Surgeon General of the Army, a certificate conferring the Carlos J. Finlay Order of Merit in the grade of *Gran Cruz* on the former American Yellow Fever Commission for its fundamental experimental work in Cuba on the etiology and transmission of yellow fever under the leadership of Major Walter Reed. The certificate will be preserved in the Army Medical Library in Washington.

A Fly-borne Bacillary Dysentery Epidemic in a Large Military Organization*

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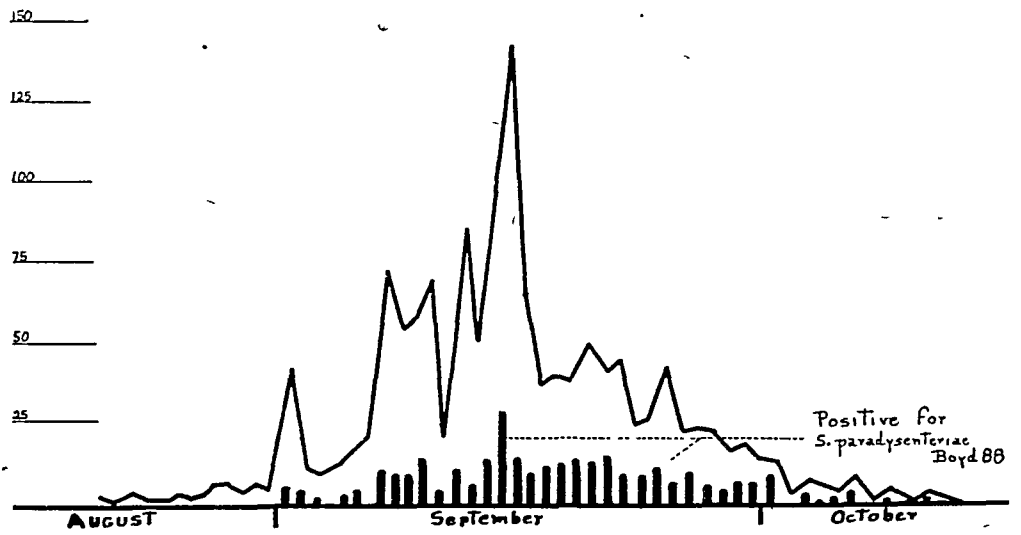
THE purpose of this paper is to report a massive epidemic of bacillary dysentery in which the same specific pathogenic organism was isolated from both flies and dysentery cases. The outbreak occurred in a large military unit which was in bivouac in one of our southern Army camps. Clinically, the dysentery was typical but of short duration. The average duration of the disease in ambulant cases was 2 days and the average hospital stay of the more severe cases was 7 days. Although this might indicate that the type of dysentery was not severe, there was considerable weakness and disability following the disease. A decisive part of a Division was thus incapacitated in this particular outbreak of 1,557 cases of clinical dysentery. Three hundred and eighty-three of the cases were bacteriologically positive. The causative organism, in 91 per cent of those found positive, was serologically and biochemically identified as *Shigella paradysenteriae*, Boyd 88. Figure 1 shows the incidence of cases and the number of stools found bacteriologically positive. This incidence was determined by taking a brief history of all individuals in the entire Division who stated that they were having or had had the disease. The number of those found to have positive cultures was determined by culturing, after September 25, 1942, all individuals with a history of having had the disease while in bivouac at this site. Figure 1 indicates that the incidence of dysentery began to increase about two weeks after the Division had been in bivouac in this area. There was no history of the presence of flies prior to the occupation of this area by the Division. About September 1, flies began to appear in numbers which became larger as the intensity of the epidemic increased. The decrease in case incidence was accompanied by a decrease in fly incidence. The latter was partially due to the enforcement of strict fly control measures and to the appearance of cool weather.

SANITARY SURVEY

A general sanitary survey showed a marked deviation from the usual enforcement of the well known sanitary protective measures. These difficulties arose in part because the stay of this unit in the bivouac area, which was originally supposed to be of short duration, was extended into weeks by exigencies of the Service. The survey showed that water, ice, and milk were satisfactory. The progressive, rather than abrupt, nature of the outbreak and

* Presented at a Joint Session of the Epidemiology, Health Officers, Maternal and Child Health, and Laboratory Sections of the American Public Health Association at the Seventy-second Annual Meeting in New York, N. Y., October 14, 1943.

FIGURE 1—Cases of Dysentery, X-Division, X-Camp, 1942 (According to date of onset as given in individual history records)



the simultaneous occurrence of the disease in all parts of the entire area indicated that the means of transmission of the infection was not food handlers.[1] However, a lack of proper operation of latrines permitted direct fly contact with human excreta. The open, straddle trench type latrines were in use but were being replaced by the enclosed box type. Excreta in some of the remaining straddle trenches was uncovered and accessible to flies. Flies were found breeding in the old closed latrines of units previously bivouacked in the area. Innumerable flies were everywhere. Inadequate protection of messes against flies afforded opportunity for the direct contamination of foodstuffs during preparation.[2, 3] These conditions, aided by latrine flooding that disseminated fecal material to greater fly contact, apparently were factors in precipitating the epidemic.[4, 5]

After an increased number of dysentery cases began to appear, steps were immediately taken to eradicate the flies and to improve general conditions of sanitation and food protection. By the latter part of October, there was a general enforcement of all sanitary measures which resulted in a marked reduction of the fly population.

It is interesting to note that dysentery abruptly stopped in one unit when it was sent from the bivouac area for training purposes to an area relatively free from flies.

METHODS AND MATERIALS

Due to the military situation, it was desirable to know something of the extent and type of infectious organisms present in the organization, as well as to investigate the possibility of confirming the rôle of the fly as the transmitting vector.[5, 7, 8] Therefore, a mobile laboratory and staff were sent to the site of the epidemic in order to study the outbreak at its origin.

A rectal swab culture survey was made of all individuals in the Division who were having or gave a history of having had the disease and of all permanent food handlers. In addition, the state of infectivity of the Division was analyzed by *selecting and culturing* one entire company as a sample. Flies were cultured from various sources, which will be shown later.

The Hardy[9] rectal swab method was

TABLE 1

Results of Swab Cultures from All Men in the Division With History of Diarrhea During Epidemic Period

	Days from Recovery to Culture	Number of Cases	Positive for Shigella	
			No.	Per cent
Men with history of diarrhea	Current	366	161	43.9
	1– 7	125	31	24.8
	8–15	269	68	25.3
	15–21	435	67	15.4
	22–28	222	40	18.0
	More than 28 days	125	16	12.8
	Days not recorded	15	0	0.0
Total men with history of diarrhea		1,557		
Total positive for shigella			383	24.6

used for collecting specimens from all individuals cultured in this investigation. The swab collected by this method was placed into Selenite-F broth (Balt. Biol. Co.) and incubated at 37° C. from 12 to 16 hours. At the end of the incubation period, plates of Salmonella-Shigella (Difco) media were streaked directly from the Selenite-F tubes. All plates were incubated for 24 hours at 37° C., when several clear colonies were picked and inoculated into Kligler Iron (Difco) slants. All typical Shigella growths, after 24 hours' incubation at 37° C. on Kligler Iron, were checked biochemically and serologically. The serological confirmations were made by spot agglutinations, using a 1:10 dilution of the specific Shigella antiserum. For specific polyvalent (V, W, X, Y, Z) differentiation and for confirmation of the specific types, *Shigella paradysenteriae,* Boyd 88, *Sh. sonnei,* and the other species isolated, macroscopic serial dilution agglutination tests were conducted.

Flies collected in fly traps were triturated and cultured in lots of 15 in the same manner as that described for the rectal swabs.

RESULTS OF BACTERIOLOGICAL OBSERVATIONS

Rectal Swab Cultures from All Individuals with a History of Diarrhea—

TABLE 2

Classification of Pathogens Isolated

Days from Onset of Disease to Culture	Sh paradysenteriae, Boyd 88	Sh. sonnei	Sh paradysenteriae, "X"	Sh paradysenteriae Race Undetermined	Sh alkalescens	Sh. dispar	Species Undetermined	Negative	Total Number Cases
Current	146	8	2	1	2	2	0	205	366
1– 7	30	0	0	0	1	0	0	94	125
8–14	65	1	0	0	0	1	1	201	269
15–21	59	2	0	0	5	1	0	368	435
22–28	40	0	0	0	0	0	0	182	222
Over 28	11	2	0	0	0	3	0	109	125
Days not given	0	0	0	0	0	0	0	15	15
Total	351	13	2	1	8	7	1	1,174	1,557
Percentage of total cases	22 5	0.8	0.12	0.06	0.51	0.45	0.06	75.5	
Percentage of pathogens isolated (383)	91.6	3 37	0.52	0.26	2.09	1.9	0.26		

NOTE: Six of the cases yielding Boyd 88 were complicated with one of the other *Shigella paradysenteriae* strains but were included under Boyd 88 because this strain was the predominating one.

Cultures were taken from 1,557 men in the Division who had diarrhea or who gave a history of having had diarrhea during this outbreak. The number found to be positive for Shigella was 383, or 24.6 per cent, as shown in Table 1. It is interesting to note from the table that 28 days after the infection 12.8 per cent of the individuals cultured were still positive for Shigella organisms. The predominating organism was *Shigella paradysenteriae*, Boyd 88, which represented 91.6 per cent of the pathogens. Other organisms present were *Sh. sonnei, Sh. paradysenteriae*, "X", *Sh. alkalescens*, and *Sh. dispar*. (Table 2).

Rectal Swab Cultures from Food Handlers—Due to the fact that the disease was widespread, it was believed that a large number of food handlers were infected and thus might contribute to the continuation of the epidemic. Therefore, all permanent food handlers were cultured to determine those carrying the organisms. Positive rectal swab cultures were obtained from 58 of the 528 food handlers (see Table 3).

This group actually constituted a sample of 528 men chosen at random from the entire Division. When divided according to the presence or absence of a history of diarrhea, it was found that 10 (12.0 per cent) of 85 food handlers with a history of diarrhea were positive, whereas 48 (10.8 per cent) of 443 without such a history were positive. These results demonstrate that in this epidemic the

TABLE 3

Results of Stool Cultures from Food Handlers *

	Days from Recovery to Culture	Number of Cases	Positive for Shigella	
			No.	Per cent
Food handlers with history of diarrhea	Current	7	3	43.0
	1– 7	8	0	0.0
	8–14	19	3	16.0
	15–21	21	0	0.0
	22–28	11	1	9.9
	More than 28 days	19	3	16.0
Total food handlers with history of diarrhea		85	10	12.0
Total food handlers with no history of diarrhea		443	48	10.8
Total food handlers cultured		528	58	10.9

* Permanent food handlers from all messes in the division

TABLE 4

Results of Stool Cultures from an Entire Company, A Sample Survey of the Division

	Days from Recovery to Culture	Number of Cases	Positive for Shigella	
			No.	Per cent
Men with history of diarrhea	Current	4	3	75.0
	1– 7	4	1	25.0
	8–14	3	1	33.3
	15–21	10	2	20.0
	22–28	5	2	40.0
	More than 28 days	6	0	0.0
Total men with history of diarrhea		32	9	28.1
Total men with no history		111	23	20.7
Total men cultured		143	32	22.4

presence of the carrier state was independent of a history of diarrhea, and indicate that subclinical infection was widespread.

Rectal Swab Cultures from One Entire Company — A representative sample of the Division, consisting of one company (143 men), was cultured. The number of men who gave a history of having had diarrhea was 32; of these, 9, or 28.1 per cent, yielded positive cultures. Of those who gave no history of diarrhea, the percentage found positive was 20.7. Of the entire company, 22.4 per cent were found to be carriers of Shigella organisms (Table 4).

the flies from the closed latrines, when cultured, were found positive for pathogenic organisms.

SPECIAL CONTROL MEASURES

Elimination of Flies—In addition to the sanitary control measures already in force, special measures were taken to bring the fly breeding under control: (1) The covering of the old latrines with heavy paper, which was packed down by 3–4 inches of oiled sand, was effective in preventing egress of fly larvae. (2) The straddle trench type of latrine was supplanted by the deep pit type, covered by fly-proof boxes. (3) Trained orderlies were placed on duty to maintain the proper oiling, fly-proofing, and upkeep of the latrines. (4) Attention was directed to the training of soldiers to utilize the latrines.

TABLE 5

Cultures from Flies

Source of Fly Batches *	*Positive for Shigella paradysenteriae, Boyd 88*	*Negative for Pathogens*
169 kitchens	5	164
95 latrines, in use	4	91
14 latrines, old closed	0	14
5 post exchanges	0	5
4 mess areas	0	4
4 random cultures	0	4
1 trailer laboratory	0	1
292 Total	9 (3.08%)	283 †

* Each batch contained 15 flies

† All lots negative for pathogens, but positive for *E. coli, Paracolon,* and *Proteus*

Cultures of Flies Collected in Representative Mess Areas, Latrine Areas, and Post Exchanges in the Entire Bivouac Area—In the first 2 weeks of October (during the decline of the epidemic), 292 different lots of flies were collected from sources as outlined in Table 5.

Each lot consisted of approximately 15 flies. These were identified as the common housefly, *Musca domestica.* Of the 292 lots, 9, or 3.08 per cent, yielded *Shigella paradysenteriae,* Boyd 88. Five of these positive lots came from field mess areas and 4 from latrines in active use. One of the most significant findings in the fly culturing study was that, although flies were breeding in great abundance, none of

Protection of Food from Flies—The screening of messes was instituted to protect food while being prepared. Flies in the messes were eliminated by swatting, spraying, and the use of fly paper and fly traps.

Elimination of Sources of Infection—An attempt was made to eliminate the sources of infection in the usual manner by the early detection and isolation of cases. In addition, a study was made to evaluate sulfasuxidine *

* Sulfasuxidine given as prescribed by Sharp & Dohme.

and sulfaguanidine * in the treatment of carriers in the field. One hundred and twelve positive convalescents were given sulfaguanidine, 132 sulfasuxidine, and 60 remained as untreated controls. Cultures were taken on all cases at weekly intervals for 3 weeks. Negative cultures were obtained at all times after treatment with either sulfonamide, whereas the controls remained positive in approximately the same percentage as shown in previous tables. Thus, either drug appeared to be effective in relieving the carrier state.

SUMMARY

The following is a summary of the findings of this investigation:

1. A large outbreak of 1,557 cases of bacillary dysentery occurred in which *Sh. paradysenteriae,* Boyd 88, was found in 91.6 per cent of the organisms isolated.

2. The onset of the epidemic was about 2 weeks after troops had moved into a bivouac area in which flies had begun to breed in large numbers because of improperly operated straddle trench latrines.

3. The epidemic was gradual in onset, widespread in distribution, reached its peak in about 2 weeks, and declined simultaneously with the gradual disappearance of flies.

4. The predominating organism isolated from the dysentery cases, *Sh. paradysenteriae,* Boyd 88, was cultured from 9 lots of flies collected in the kitchens and operating latrines.

5. In one unit sent away from the bivouac area for training, no further cases of dysentery occurred after 48 hours.

6. The rate of asymptomatic infections or carriers in 443 food handlers was 10.8 per cent. This would appear to indicate that a state of immunity does exist against the causative organism for the disease.

7. The importance of the common housefly in the transmission of bacillary dysentery should be stressed more than it has been in the past, and corresponding attention should be directed to its control.

* Sulfaguanidine given as prescribed in *Circular Letter 56,* Office of the Surgeon General, War Department, Army Service Forces, Washington, D. C.

NOTE

It is desired to express appreciation for assistance in this problem to Colonel S. W. French, M.C., Colonel Charles G. Souder, M.C., Brig. General Henry C. Coburn, Jr., M.C., Lieutenant-Colonel Harry E. Wright, M.C., Captain Norman L. Cressy, M.C., Captain L. Roland Kuhn, Sn.C., Captain Carl T. Nelson, M.C., Captain Harry A. Feldman, M.C., U. S. Army, and Hortense E. Garver, P-1, Junior Bacteriologist, Fourth Service Command Laboratory; Members of the Subcommittee on Dysentery, Commission on Tropical Diseases, Board for the Investigation and Control of Influenza and Other Epidemic Diseases in the Army; Dr. Carl TenBroeck, Director, Dr. John B. Nelson, and Dr. Frederick Bang, Jr., Rockefeller Institute for Medical Research, Princeton, N. J. Appreciation is also expressed for special technical assistance to Frances C. Sterne, SP-5, Medical Technician, and Marguerite Jane Barnes, SP-4, Assistant Medical Technician, Fourth Service Command Laboratory, and other members of the Fourth Service Command Laboratory Staff.

Appreciation is further expressed to Brig. General James S. Simmons, M.C., Colonel Stanhope Bayne-Jones, M.C., Preventive Medicine Section, Office of The Surgeon General, U. S. Army, Washington, D. C., and Colonel George R. Callender, Director, Army Medical School, Washington, D. C., and to Major Jerome S. Harris, M.C., and First Lieutenant Dewitt F. Mullins, Jr., M.C., Fourth Service Command Laboratory, for their assistance in assembling and compiling this material.

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American Journal of Public Health
and THE NATION'S HEALTH
Official Monthly Publication of the American Public Health Association

Volume 34 July, 1944 Number 7

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PHYSICIAN, POLICEMAN, OR PEDAGOGUE?

WITH the elimination of water supplies and milk supplies as causes of large-scale community epidemics, the control of food handling in the store and the restaurant has become the most important factor in the control of alimentary infections in most American cities. The return from African and South Pacific service of hundreds of thousands of carriers of the germs of amebic and bacillary dysentery will make this problem one of major significance in the next few years.

There are three different correlated approaches to the control of food-borne infections. The first of these is the medical approach, the attempt to eliminate sources of possible infection by routine health examinations of food handlers. This procedure has serious limitations in the opinion of thoughtful health administrators. The infectivity of individuals varies from week to week and from day to day; and no system of examination can protect against the transient positive throat culture or the temporary staphylococcus infection on the finger. Routine health examinations have been defended by some as aids in the general community program for finding cases of syphilis and tuberculosis. The place to find new cases of syphilis and tuberculosis, is, however, among the contacts of known cases; and routine examination of random population groups has been rightly described as " a slipshod substitute for intelligent epidemiology." It may well be desirable to insist on stool examinations for servicemen returning from the tropics who desire to serve as food handlers. As a general basis for the control of food-borne disease, however, medical supervision is not the answer.

A second approach to the solution of this problem is to be found in law enforcement. This is obviously an essential part of the program. Codes of cleanliness for food handling establishments, licensing of such establishments, regular and conscientious inspection service, must be available for effective control. Yet all this is not enough. The policeman, like the physician, can only visit a given restaurant at relatively infrequent intervals; and much may happen between visits.

What we really need for effective control is an inspector on the ground every

day and every hour of the day; and to approximate such an ideal we must invoke the forces of education. No proprietor or responsible administrator desires the scandal of an epidemic among his customers. There is no real diversity of interests here, only the need for enlightenment and motivation. The major purpose of each inspector's visit should be the enlistment of informal deputies on the spot who can note deviations from sanitary practice in the day's routine—who can detect the waiter with a cough, the pastry cook with an infected finger. The Memphis food handlers' school [1] which, through an eight day course of instruction (conducted with the coöperation of the local Restaurant Association and Chamber of Commerce), reached 25 per cent of all food-handlers in the city, and the school at Miami, conducted by the Dade County Health Department [2] are excellent examples of progressive public health control. By the aid of such special devices and by making every contact of the physician and the sanitary inspector primarily an educational contact, our program of food sanitation can be made truly effective.

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THE HEALTH COUNCIL AND ITS POSSIBILITIES

THE building of sound health programs for our local communities is too important to permit of any waste of effort or duplication. Every city of any size has a multiplicity of groups concerned with one or another phase of public health—official health departments, private health agencies, clinics, hospitals, and professional organizations of physicians, dentists, and nurses. Working together in a health council with full understanding of each other's programs, they can attain maximum results with limited staffs and funds. Such a council can serve as a forum for discussion of health problems, a medium for continuing analysis of community needs and for stimulating ways of meeting them, a means for avoiding duplication and friction, machinery through which citizen participation can be made effective, and sound community health programs can be formulated and kept up to date.

When competently directed, the health council has proved its worth. Operating, usually, as a division of the Community Chest or Council of Social Agencies, the council functions most effectively when it has a considerable measure of autonomy, its own paid staff, and a reasonable budget. Without these, it has little chance of success in any sizeable city. With them, it can be an effective ally of the official department and a strong unifying force for promoting public health.

When Dr. Haven Emerson made a critical analysis of the Cincinnati Public Health Federation at its own request several years ago, he termed it the "Community's Conscience in Health Matters." Having the confidence of the Health Departments of the City and County, the faculty of the College of Medicine, the Academy of Medicine, the Dental Society, the Graduate Nurses' Association, and the backing of the Community Chest, this Federation has admirably demonstrated the effectiveness of sound coördination.

All health agencies, public and private, and the appropriate professional

organizations, as well as social and civic agencies with a direct interest in public health, are represented in the Federation's delegate body. This group elects the officers and twenty-five members at large who, with the health commissioners of the City and County and the chairmen of the thirteen councils, make up a Coördinating Committee—the active governing body of the Federation. The 500 citizens, who participate in the Federation's work as delegates or members of one or another of its thirteen councils, constitute its greatest strength.

Each of the Federation's Councils is made up of organizations and individuals active in its particular field, and develops its own program subject to the approval of the Coördinating Committee. Ten of the Councils—Cancer Control, Child Hygiene, Clinics, Diabetes, Health Education, Heart, Mental Hygiene, Mouth Hygiene, Community Nursing, Nutrition—were organized as divisions of the Federation. Their activities consist primarily of coördination, education, and programming. The Anti-Tuberculosis League, the Better Housing League, and the Social Hygiene Society have been recognized as the Federation's Councils in those fields.

The Federation has fought consistently to strengthen the official Health Departments which it considers the most important cog in the community's public health machinery; it has initiated and stimulated and coördinated programs for cancer control, diabetes, heart disease, enteritis, and appendicitis; through the joint efforts of diet specialists, it has carried on an effective nutrition program; it has organized a sizeable and effective Negro health clinic where Negro doctors and dentists had their first local opportunity for participation in clinic work; it has launched a strong centralized mental hygiene clinic; it has been influential in having a children's orphanage transformed into a much needed children's convalescent home.

Coöperating with the Anti-Tuberculosis League, the Federation secured a $2,000,000 bond issue which built the County's modern Tuberculosis Hospital. It conducted, through a special Citizens' Committee, a successful bond issue campaign for $3,500,000 to construct a new County Home and Chronic Disease Hospital which is in the blue print stage ready for building as soon as the war ends. It likewise conducted a $1,500,000 bond issue campaign which will result in important improvements in the City's General Hospital when critical materials become available.

The Cincinnati organization maintains continuing studies of resident mortality by age, sex, and race groups, and makes a comparative analysis of mortality in thirteen comparable American cities. The first published report of these studies for three years, 1929–1931, was widely publicized and led to notable changes of emphasis in the local health program. Similar studies for the period, 1939 through 1941, are being completed and will be published within the next few months.

Due to its recommendations, some local health agencies have voluntarily modified their activities, others are making changes, and two have transferred their work to tax support.

A good example of teamwork is a program of health education sponsored jointly by the Health Department, the Academy of Medicine, and the Federation. The program consists of car cards in buses and street cars, a series of monthly posters in factories, several regular radio programs, daily or weekly health series in two of the large dailies and in suburban papers, exhibits, monthly bulletins for Parent-Teacher Associations, and periodical nutrition bulletins for

families of low income. The health messages prepared and distributed in a single year would fill eight or ten fair-sized books. Health education is an especially logical activity for a health council because its scope embraces the whole field from dental to mental health and because official departments usually find it difficult to secure funds for effective education and publicity.

Concentrating its efforts on health problems related to the war, the Federation initiated a Consultation Service for men rejected at the local Induction Center and is now conducting psychiatric screening of registrants in coöperation with Selective Service. It has played an important rôle in the effort to reduce unnecessary demands upon physicians and nurses and in promoting enrollment in schools of nursing.

The Federation's work is financed principally from Community Chest appropriations. Its staff consists of an Executive Secretary who is also the Head of the Better Housing League, an Associate Secretary (a physician who serves also as Director of Research), a Health Education Assistant, and two volunteers. One of the volunteers gives full time and does a remarkably efficient job as Assistant Secretary. The other volunteer, who devotes most of his time to the work, is a distinguished authority on advertising technics and is the Federation's President.

Cincinnati is cited as an example because it has one of the oldest of such coördinating health agencies. Other leading Councils, such as those in Cleveland, Boston, Louisville, Chicago, or Philadelphia, would have served as well. Health councils are now functioning in about fifty cities. Unfortunately, many of them are weak and ineffective because they lack funds and leadership. There is no magic in the word "health council." Only if such a council has vigorous, intelligent direction and financial backing can it develop effective teamwork in the health field.

Medicine and the allied sciences have given us powerful tools for health building, of which no community is making the fullest use. The health council is one means by which citizens and community health forces can unite to make such tools effective.

EVALUATION OF CLINIC NURSING SERVICE

THE health administrator should be keenly interested in the intensive survey of Public Health Nursing Services in Clinics sponsored by the N.O.P.H.N. Committee on Nursing Administration. This study covered 212 clinics and health conferences of various types (child health, crippled children, maternity, tuberculosis, and venereal disease) in 38 states—a very representative sample. As a basis for the survey, lists were drawn up of 27 activities which might be performed in preparation for the actual clinic session, 105 activities which might be performed during the session, and 15 activities which might be performed after the session. The lists of these activities were then submitted to a jury of public health administrators, physicians, and public health nurses for the selection of those functions which should be performed by the public health nurse and in this way two pre-clinic, seven clinic, and four post-clinic activities (with other functions in certain special types of clinics) were defined as among the primary tasks of the public health nurse. This standard was then checked against actual practice in the 212 clinics studied.

The basic duties so selected were chiefly concerned with two fundamental functions—direct personal contact with the patient and health education. These are the two things which only the trained public health nurse can most effectively accomplish. They differ of course with different types of clinics. In the case of child health there were 18 public health nursing functions, 14 of which were actually performed by nurses in 50 per cent of the clinics studied. In the case of crippled children's clinics, only 7 out of 16 functions were actually performed by public health nurses in 50 per cent of the clinics. Maternity clinics showed 9 out of 13 functions so performed; tuberculosis clinics, 10 out of 15; venereal disease clinics, 6 out of 16. Clearly many tasks which should be accomplished by the public health nurse are either not being performed at all or are being delegated to less competent personnel.

On the other hand, the nurses in these clinics are devoting much of their time to many other activities not accepted as essential public health nursing functions—to duties such as preparing examining tables, distributing and caring for linen, recording weights, making out reports, and cleaning up equipment, which could quite as well be performed by nurses without public health training or by volunteers or paid assistants.

Assuming—as we must—that the primary purpose of the health clinic or conference is an educational one, it is clear that the practices revealed by this study not only represent a serious waste of professional time but also involve failure to attain maximum results from the procedure as a whole. It is the responsibility of the public health administrator, first, to secure well qualified public health nurses (only 32 per cent of those found functioning in the present study had completed a special program of study in public health nursing and only 53 per cent had had prior public health experience); and, second, to organize the service so as to use appropriate personnel for each particular task.

We have only touched on the highlights of this N.O.P.H.N. report, which contains not only analysis of various clinic functions but very suggestive time-study data. The entire report should be read to obtain its full value.[1] Above all, health officers and directors of nonofficial health agencies would do well to obtain from the N.O.P.H.N. copies of the appraisal schedule used and to evaluate the organization of the clinics and conferences for which they are responsible by the excellent procedure here developed.

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Industrial Sanitation

Engineering Section

IT is universally realized that war production is the very core of our nation's offensive action, and will remain a paramount duty until the war ends. Experience during the first year and a half of war has clearly shown that the worker himself is the most important factor in getting out production. Since we have practically reached the limit in the size of our labor force, we are therefore faced with the increased necessity of effectively utilizing and conserving all of our man power resources. Industrial hygiene services have a major part of the responsibility in meeting this challenge by assisting industries in the prevention of illnesses and deaths from industrial poisons, and in the maintenance of physical fitness of all workers. It goes without saying that in the field of industrial hygiene the engineer has a major contribution to make.

Estimates made by the War Manpower Commission show that of a total labor force of nearly 63,000,000 persons (including the armed forces), something like 38,000,000, or 60 per cent, are in the armed forces or engaged in activities essential to the war. Aside from the large numbers involved, the industrial hygienist's task has been made even greater by the fact that the labor force itself has changed materially. This tremendous change in the make-up of the working force is of utmost significance, both in military service and in war production for even these largest consumers of man power are employing women, adolescent boys, the aged, and the handicapped. Furthermore, when we speak of man power today we inevitably must include all of us—the professional and technical personnel responsible for production and for health and safety; the supervisory personnel; the workers themselves. This altered labor force, the speed-up associated with production, longer hours of work, and the increase in exposure to many hazardous materials and conditions, have all augmented the task of the industrial hygienist. Furthermore, because the industrial hygienist has done a good job in the field of occupational disease control, he has had thrust upon him more problems, not only in number, but also in variety. Unfortunately, the task force in industrial hygiene has not materially increased for handling these greatly increased responsibilities.

Prior to the war considerable progress had been made in the establishment of industrial hygiene services throughout industry, and in official and nonofficial agencies. Large industrial establishments had begun to employ physicians, engineers, and chemists for specific work in the field of preventive medicine. Nonofficial agencies, such as insurance companies, universities, and foundations, had also established industrial hygiene services. Perhaps the greatest impetus to industrial hygiene in official agencies was given by the

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Organized 1935. Published reports: *Year Books* 1936–1937, 1938–1939, 1941–1942.

federal government when it began to allot funds for this work under Title VI of the Social Security Act. At the beginning of the war more than 30 states and several cities had established industrial hygiene services within their health departments. Only the armed services had made no provision for industrial hygiene except in a very limited way.

When the President declared a state of emergency in 1940, the various governmental agencies became more active in this field. The Army and Navy established industrial hygiene sections in their respective divisions of preventive medicine, while the Public Health Service started to expand its task force as early as 1940. It was not until May, 1942, that the U. S. Maritime Commission began to interest itself in the industrial health field. By the time war was declared there were approximately 500 industrial hygiene personnel in the country, exclusive of physicians in the practice of industrial medicine.

At the very beginning of the national defense program, the U. S. Public Health Service, through the Division of Industrial Hygiene, National Institute of Health, was asked by the Subcommittee on Industrial Health and Medicine of the Office of Defense Health, and Welfare Services to assume leadership in coördinating a nation-wide industrial hygiene program. In view of the fact that the Division of Industrial Hygiene had developed over the years, in coöperation with the various states, a nation-wide industrial health program, it offered its facilities, both in the field of research and direct services, to the War and Navy Departments. Before outlining how such a coördinated program has been developed through the present emergency it may be well to discuss briefly the responsibilities of the various agencies in the war program.

Navy Program

The U. S. Navy Department, aside from the men of military status, has the responsibility for the conservation of health of nearly 750,000 Civil Service personnel employed in approximately 700 naval stations. In order to meet this responsibility, the Navy Department created a Section of Industrial Health in the Division of Preventive Medicine of the Bureau of Medicine and Surgery. This Section of Industrial Health, in collaboration with the Office of the Assistant Secretary of the Navy, attempts to control the industrial environment in Navy shore establishments by analyzing occupational disability reports and by making recommendations in regard to the detection and elimination of potentially hazardous working conditions; by preparing information on various hazardous materials and processes; and by coordinating the efforts of the industrial hygiene field personnel.

To achieve these objectives, the Navy has a staff of more than 50 medical officers and 40 industrial hygienists, many of whom are engineers. These men have received postgraduate instruction in industrial hygiene and are now on assignment at the various Navy shore establishments attempting to solve the problems of lost time due to illness and injury, to increase production and efficiency, and to promote morale among the employees.

In the Navy industrial hygiene program the Office of the Assistant Secretary of the Navy is responsible for accident prevention, while the Section on Industrial Health in the Bureau of Medicine and Surgery is responsible for the protection of the general health of Navy industrial personnel. Although these functions are administered separately, they are very closely correlated. For example, the medical officers undertake the study of health hazards associated with occu-

pational activities, the conduct of technical surveys to determine potential or existing exposures, and the laboratory analyses necessary to evaluate such exposures. These observations and recommendations are made available to the safety officer, who is responsible for the application of the necessary control measures.

The Navy Department safety engineer serves as adviser to the Director of the Division of Shore Establishments. This division develops the standards for safety protective equipment used by the Navy stations and is responsible for the development of general safety rules for shore establishments of the Navy. The various Navy Department safety engineers make frequent field surveys of naval shore establishments and serve in a technical advisory capacity in problems of safety engineering. At each establishment a naval line officer is designated as safety officer and is responsible for the administration of the accident prevention program. He may be assisted by a junior line officer, and one or more civilian safety inspectors. At the present time the Navy has approximately 500 such safety personnel.

The Section of Industrial Health, on the other hand, serves in a liaison capacity to the other bureaus of the Navy Department, to the Maritime Commission, and to various nonofficial agencies. The Section also serves the seagoing Navy by aiding in the establishment of proper control of its industrial hygiene problems.

MARITIME COMMISSION PROGRAM

At the present time the U. S. Maritime commission is responsible for a working population of approximately 1,200,000 persons employed in Maritime and Navy contract yards. This does not include government-operated Navy yards. In general, the health and safety programs in these yards follow very closely the recommendations laid down jointly by the U. S. Maritime Commission and the U. S. Navy Department in the minimum standards developed by these agencies.

The Maritime Commission has an industrial hygiene force loaned to it by the Navy Department, consisting of 3 medical officers functioning in the Atlantic Seaboard, Gulf Coast, and Pacific Seaboard regions, and 8 nonmedical industrial hygiene officers, of whom some are engineers. The Great Lakes region has 1 engineer officer, but no physician. There is also a safety officer in each of these four Martime Commission regions. All this work is coördinated under a Chief Health Consultant, coöperating closely with a Chief Safety Officer.

It may be seen from this brief description of the Martime Commission program that the few personnel it has on industrial hygiene are primarily employed in a consulting capacity. Any technical studies which are needed in these yards, are, as a rule, performed by the various state and local industrial hygiene units in which the yards are located. More information on this phase of the work will be presented in the appropriate section of this report.

WAR DEPARTMENT PROGRAM

The Surgeon General of the Army was given the responsibility of overseeing the health of workers in all government-owned plants but the actual inspection of them was divided between that official and the U. S. Public Health Service. Those plants owned and operated by the government receive inspection by Army personnel. There are approximately 550 such plants employing roughly 800,000 civilians, all of whom are on civil service. These establishments include manufacturing plants—Ordnance, Chemical Warfare, Signal Corps, and Quartermaster Corps; fabricating and repair plants—

Ordnance, Air Force, and Chemical Warfare; explosives plants, bomb loading, shell loading, fuse and booster types—Ordnance and Chemical Warfare; while cargo shiploading plants come within the purview of the Ports of Embarkation.

In order to handle the problems in these plants operated by the government, the Surgeon General's Office has established an Occupational Hygiene Branch in its Division of Preventive Medicine, which has two medical officers and one engineer officer at its headquarters. The Occupational Hygiene Branch maintains a laboratory, whose personnel consist of 2 medical officers and 18 engineers. There are also in each Service Command and each Air Service Command an industrial medical officer and, in some, an engineer officer. The Army also attempts to maintain in all of its larger plants medical officers and in some cases engineers. There are, of course, in all of these plants contract surgeons and Civil Service physicians doing industrial hygiene work. All told, there are 120 medical officers, 60 contract surgeons, and about 20 Civil Service physicians for this type of work.

In the second category of War Department plants are those which are owned by the government but operated under contract. Although these too are a responsibility of the Surgeon General's Office, the Division of Industrial Hygiene, National Institute of Health, acts as the agent for the Surgeon General's Office of the Army in the inspection of these plants. There are several hundred of these plants employing approximately 750,000 workers. They are our largest producers of the tools of warfare. The Public Health Service constantly maintains in the field three inspection crews, each consisting of 1 general physician, 1 physician-dermatologist, 1 engineer, and 1 chemist. In addition, the necessary supporting laboratory personnel for these crews are maintained at the Division's laboratories at the National Institute of Health.

For the purpose of coördinating the inspection work of the Public Health Service with that of the Army, an industrial hygiene unit was established at the Chicago headquarters of the Safety and Security Branch, Office of the Chief of Ordnance. A medical officer from the Army and a medical officer and an engineer officer from the Public Health Service have been assigned to this unit which initiates plant surveys, as needed, by personnel of the Public Health Service and of the Army Industrial Hygiene Laboratory. The unit also maintains general supervision over these activities, reviews critically the reports resulting from these surveys, makes follow-up visits to ascertain the effectiveness of control methods, and gives consultation on the most practicable methods of putting recommendations into effect.

Among other functions of this coordinating unit may be listed the development and promulgation of standard codes of medical services and engineering control of health hazards; the dissemination of new information; the review of safety audits made by the safety inspectors of the Ordnance office. From time to time meetings of plant physicians and engineers working in government plants have been held with the medical and engineering personnel of the Office of the Surgeon General of the Army and the Public Health Service.

PUBLIC HEALTH SERVICE AND STATE PROGRAMS

The above review of the Army program serves to describe an important part of the field work of the Division of Industrial Hygiene. No attempt will be made in this report to discuss the research work which is one of the

major activities of the Division. The other wartime industrial hygiene work of the Public Health Service is intimately concerned with the activities of the various state and local industrial hygiene units. It is through these units, in coöperation with the Public Health Service, that services are provided for the third type of plant engaged in the production of war materials, namely, the privately owned, privately operated plants, of which there are a great number and variety.

In 1940, the majority of state and local industrial hygiene units had merely skeleton forces, even for peacetime needs. The staffs usually consisted of a physician, an engineer, a chemist, and occasionally a nursing consultant. Only a few large industrial states, such as New York, Michigan, Pennsylvania, and Connecticut, had larger staffs, and even these were too small to begin to meet the needs confronting them. Furthermore, the state units immediately felt the inroads made upon them by the recruiting program of the armed services. In fact, most of the industrial hygiene personnel mentioned previously in this report as being attached to the Army and Navy, came from the state units.

The Public Health Service began recruiting and training personnel early in 1941, and obtained many of its men from the general public health field. In a few instances it has given Reserve commissions to state and local personnel, by arrangement with the respective state health commissioners.

At the present time, the total force of the state and local units consists of 46 physicians, 141 engineers, 22 nurses, and 45 other professional personnel, such as chemists. Of these 254 professional personnel, approximately 60 are on loan from the Public Health Service.

Some idea of the inadequacy of the present industrial hygiene forces in the states can be obtained from a brief summation of the new responsibilities given these states and their accomplishments. For example, the War Manpower Commission is calling upon the Public Health Service, and through the Service upon the states, for the inspection of many private war plants to determine whether conditions are such as to warrant the release of men from some plants to others, because of alleged poor working conditions. A striking example is the high "quit" rate in the aluminum refining industry, where workers claim that unhealthy conditions in pot rooms make it difficult to work safely and efficiently. It is up to the Public Health Service and the states in which aluminum refineries are located to study these working conditions and render reports for the guidance of the local offices of the War Manpower Commission.

Again, the War Production Board has established more than 2,500 labor-management War Production Drive committees and has urged all of these committees to become active in the field of health and safety. These committees are calling more and more upon the Public Health Service and the state industrial hygiene units for advice and services.

The Provost Marshal General's Office, which has responsibility for internal security in all war plants, has recently arranged with the Public Health Service for the routine inspection by the state and local units of many private facilities coming under the jurisdiction of the Provost Marshal General's Office. Similar arrangements have been made with the Chief of the Office of Ordnance for the inspection of private facilities, and lately with the U. S. Maritime Commission for the inspection in the interest of health of several hundred shipyards located in 28 of our states.

No attempt will be made to cite the

various accomplishments of the federal forces, except to indicate that not only have all of the plants now in operation received initial inspections, but some have been surveyed several times. It is also gratifying to note in passing that as a general rule recommendations made by the various inspecting crews are put into force quickly. In so far as the state units are concerned, some idea of the extent of the ground covered may be obtained from a recent summary made by the U. S. Public Health Service for the fiscal year 1942. Approximately 6,000 establishments employing nearly 3,000,000 workers were covered by the state and local units in that year.

It is evident that although a nation-wide coördinated industrial hygiene program exists, and although it is performing a difficult task heroically, still the amount of services rendered is far from adequate if we are to aid in maintaining work schedules and production by reducing lost time due to disability. It is therefore of paramount importance that everything possible be done to retain present personnel at their posts in the states. The Advisory Committee for the Procurement and Assignment of Sanitary Engineers of the War Manpower Commission recently revised its criteria for essential sanitary engineers in order to give more adequate consideration to those engaged in industrial hygiene work. The new definition of essentiality for industrial hygiene engineers takes into consideration the working population in each state, thereby insuring in nearly every instance that present forces will not be depleted.

FUTURE CONSIDERATIONS

This report has attempted to present the highlights of the industrial hygiene program of official agencies in the present war effort, and the responsibilities involved in the maintenance of the health of our war workers. The manner in which the industrial hygiene program has been organized, developed, and carried on has also been briefly depicted. Those developing this nation-wide program attempted to accomplish a dual purpose: (1) to meet quickly and effectively the demands on industrial hygiene services created by the war production program, and (2) to create an organization which would function in the peace years as well as in the war emergency. The program was developed on a sound and permanent foundation with the realization that the need for industrial hygiene after the war will be even greater than it is today. Many of our problems may be similar in character, but they will certainly be wider in scope.

To mention but a few of the problems in industrial hygiene which will confront this nation, one should list such items as the problems created by the return of service men to their former jobs; programs for men let out of war industries, for the reconversion of these industries to peacetime production; plans for rebuilding cities and terminals; new transportation facilities; research; and services in the fields of health, nutrition, medical care, education, and recreation. There will be the important problems of rehabilitation, both physical and vocational, of our fighting army, as well as our army on the production front. Plans are even now being considered for broadening the scope of social insurance, for labor and its participation in the new expanding economy, including not only working conditions, rates and hours, but also relations with management and the consumer, and the training of new skills.

These and many other problems which will confront us in the peace years should be the concern of industrial hygienists. In order to meet them effectively, however, we should begin

now to train additional personnel and to provide additional funds for these programs. We shall certainly be better prepared to meet these post-war problems in industrial health than ever before. By the end of this war, through the efforts of all the agencies now engaged in industrial hygiene work, more professional people will find themselves versed in industrial hygiene skills. Management, labor, and the public will have come to accept industrial hygiene as commonly as they now accept other health services. Legislation will need to be extended and made more uniform in order to protect the working population against industrial health hazards, while emphasis on industrial health services in the small plants will need to be considered and extended.

Only a few of the problems and opportunities which will confront the industrial hygienist after the war have been mentioned. To make sure that these future activities receive proper guidance and implementation, those who have the knowledge and the responsibility in the field of public health must accept the challenge and begin now to take part in the planning. Engineers have a major rôle in this planning. They have never been lacking in vigor, vision, and the knowledge to take the initiative; and both labor and management will welcome our taking our rightful place. This will all be possible because, as already indicated, the present wartime industrial hygiene program has been built not as a temporary expedient but on a firm and solid foundation.

W. SCOTT JOHNSON, *Chairman*
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Wartime Shellfish Problems*

Engineering Section

ON account of the war, only those members of the committee who were able to attend the annual meeting of the National Shellfisheries Association, met at Philadelphia in June, 1943. A few other persons interested in the technical and scientific problems of shellfish sanitation attended.

It was the consensus of opinion of the committee members that because of the man power shortage and scarcity of materials needed to keep plant and equipment at par, normal sanitary standards would be more difficult of attainment during the coming season than is normally the case, and would become more difficult the longer the war continued. For this reason, it was agreed that the vigilance of all those responsible for the cleanliness and safety of shellfish needed to be redoubled. Although additional vigilance is called for, unnecessary refinements, yielding little or no additional protection to shellfish consumers, should not be suggested in wartime when normal supplies of materials and labor are lacking. It was agreed that a progress report recounting the present status of shellfish sanitation and inviting attention to the problems still confronting the shellfish regulatory officials and the industry would be desirable. This report is therefore presented.

Since in many shellfish producing states, it is the responsibility of sanitary engineers to decide which areas shall be closed, and since wide divergencies appeared in conclusions reached as a result of sanitary survey and as a result of laboratory examination, this committee, in its 1936 report, invited attention to the need for a more satisfactory bacteriological check on the safety of shellfish offered for human consumption and also for a reëxamination of the bacteriological methods employed in checking the safety of shellfish growing areas from which shellfish might be marketed without further processing. Such studies were begun by the Public Health Service but were interrupted by the war.

A committee from the Laboratory Section of the Association at its 1942 meeting recommended, and the Association has recently adopted [1] a suggested method for the examination of shellfish. Important modifications of the methods recommended by the Association in 1912 have thus been made. It will be interesting to many, and important to the shellfish industry, to see whether closer correlation between results found on laboratory examinations, as obtained by following the new standard methods, and the results obtained by sanitary survey can be attained. It will also be interesting and important to see whether oysters, soft clams, hard clams, and mussels will show equal degrees of contamination when taken from the same growing areas, and whether real significance can be attached to results obtained from the bacteriological examination of shellfish

* Progress report of the Committee on Shellfish.

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Organized 1928. Published reports: *Year Books* 1934-1935, 1935-1936, 1936-1937, 1937-1938, 1938-1939, 1939-1940, 1940-1941.

found on the markets of interior cities. These are some of the problems still confronting regulatory officials and the shellfish industry.

In addition to these, there are special problems of sanitation brought on by wartime conditions, some of which are discussed briefly below.

SOME OF THE WARTIME PROBLEMS

1. Changes in boundaries of closed shellfish areas have become necessary in certain areas because of increasing quantities of sewage partially treated or untreated, discharged into nearby shellfish growing areas due to the concentration of war workers in coastal areas, near shipyards, or at marine, military, or naval bases.

2. Finding suitable container material for shucked shellfish to take the place of tin has become a problem for packers of shucked shellfish and regulatory officials.

3. Evaluating the effectiveness of shellfish sanitation measures more carefully and more scientifically than heretofore has become of prime war time importance because of man power shortages.

4. Methods to encourage greater production and consumption of shellfish foods have brought new problems to areas where mussels are being harvested and to areas where intensive cultivation of oysters and clams are being employed.

The Army's inclusion of sea food as a portion of the diet of troops has tended to intensify these problems so that members of the shellfish industry have urged regulatory authorities to remove restrictions on contaminated areas to make it easier to meet increased demands.

1. Changes in boundaries of closed shellfish areas—The great expansion of military, naval, and industrial areas along the coast on salt water estuaries or tributaries has, in some instances, made it necessary to close large areas of productive shellfish grounds because of increased quantities of sewage being discharged into waters tributary to such areas. The movement to reduce the pollution of large bodies of coastal waters was making good progress when the war broke out. The demands of the war for ferrous materials practically put a stop to the use of such materials in sewage treatment projects, except in those projects essential for the protection of public health. The result has been that sewage treatment projects needed for normal civilian population increases have been almost impossible to obtain.

In view of the increasing importance that attaches to the efficient production of food for ourselves and our Allies, it does not seem unreasonable to your committee to expect that reasonable quantities of critical materials should be released by WPB for sewage treatment works where increased quantities of sea food could thus be made available. Since shellfish are good substitutes for meat which is very much needed in the war effort, and since they are sources from which important food elements needed by the body can be obtained, it seems reasonable that their production should be fostered in times of food shortages such as now prevail. The oyster crop now is equivalent in food value to about 400,000 dressed steers yearly.

2. Experiments with various materials seem to indicate that containers made of black steel, coated with a suitable coating, are the best substitute thus far found for packing shucked shellfish. It appears to be better suited for containers of shucked shellfish than either glass or heavily paraffined fiber, since it is a close imitation of the tin cans so extensively used heretofore in the industry, and can be used with machinery now installed in packing plants.

3. Evaluating the effectiveness of necessary shellfish sanitation measures in such a way as to disclose accurately the degree of compliance with sanitary requirements improves the efficiency of control measures. In times of man power shortages, maximum efficiency is essential.

A short time prior to his death, Leslie C. Frank suggested that the same principles used in developing milk sanitation programs could be used effectively in shellfish sanitation practices. These principles are, briefly:

1. The sanitary requirements must be accurately stated.
2. The public health reason to justify the requirement must be given.
3. A clear statement of what constitutes satisfactory compliance must be enunciated.
4. If the relative importance of each requirement can be indicated by assigning a weight which is commensurate with the importance of the requirement, then the percentage of compliance attained can be approximately expressed with a single figure, e.g., 60 per cent, 80 per cent, 90 per cent, etc.

The preparation of a manual of shellfish sanitation requirements, based on the above principles, was begun before the war. Some of the members of the committee have participated in its preparation. It seems probable that the manual may be put to an unofficial trial during the present shellfish season, and constructive criticism can thus be invited before it is officially adopted as a guide for determining compliance with requirements. It is believed that the use of this manual will add to the efficiency and effectiveness of the work of shellfish inspectors, will tend to bring about uniformity of enforcement throughout the entire shellfish industry, and will gradually bring about a correction of insanitary conditions. Those interested in obtaining a copy of this shellfish manual should write to the Surgeon General, U. S. Public Health Service.

4. Methods for increasing the production of shellfish foods—These methods fall under four principal heads: (a) the wider utilization of mussels; (b) the exploitation of deep sea shellfish areas, such as deep sea clam areas; (c) the more intensive cultivation of inshore shellfish areas both for oysters and for clams (An intensive method of oyster culture recently demonstrated in America is described in this report.); (d) the purification of shellfish from moderately contaminated areas and the transplanting of shellfish from such areas into clean waters.

The wider utilization of mussels on the Atlantic and Pacific coasts calls for increased vigilance in avoiding cases of mussel poisoning. Two wholly different types of mussel poisoning occur. One apparently occurs only in the California mussel *(Mytilus californianus)*. A wholly different form of poisoning may occur from eating the Black Sea mussel *(Mytilus edulis)* now being widely advertised. It is claimed that it is dangerous to eat black mussels which are so far gone that their shells gape. Fisheries and market inspectors should be warned to be on the lookout for gaping mussels and to warn the trade to be careful not to include such mussels in shipments or in the retail trade. Mussels are sensitive to high temperatures; hence it is even more important to store and ship them at low temperatures than is the case with clams or oysters.

Cases of mussel poisoning occurring on the Pacific coast have attracted the attention of scientists for many years. Methods for determining the presence of the chemical poison responsible for causing the illness have now been developed.[2] Sufficient study has been directed to the problem of mussel poisoning to indicate that the trouble is seasonable and is apparently due to the reaction produced by the presence in the diet of a high percentage of

the dinoflagellate *Gonyaulax catenella*. This indicates a method for dealing with the problem.

The utilization of deep sea clams and other shellfish calls for a special method of food preservation and marketing, and does not seem to present any particularly difficult sanitation problems.

The more intensive utilization of inshore shellfish growing areas calls for increased vigilance to avoid accidental sewage contamination of the shellfish. The committee has, in the past [3] made recommendations for dealing with hazards incident to the floating or water storage of shellfish, and its recommendations have been incorporated in the U. S. Public Health Service Minimum Requirements for endorsement of state shellfish control measures and certifications for shippers in interstate commerce. As the intensive utilization of inshore areas increases, the importance of the committee's recommendations for dealing with these hazards increases, since these areas are close to the sources of pollution and are not protected by dilution, because they are located in shallow water.

In recent years, the intensive cultivation of oysters for the half shell trade, by placing them on trays supported a little above the bottom in areas where they are exposed at low tide, has come into commercial use in this country. Modifications of this method have been practised since the early days of the Roman Empire, and by the Chinese for hundreds of years.

The very rapid growth of the oysters, and the extra price obtained for them, may lead to the more extensive utilization of this method of oyster culture in this country as it has in Europe, notably in Belgium and France.

A detailed description of the practice, as employed currently in portions of Virginia, is included here.

Intensive Oyster Culture

Our reason for describing this method of oyster culture in this report is because we are led to believe it can greatly increase our sea food resources at a time when increased food production is important, and to point out certain sanitary precautions which should be observed whenever this method of oyster culture is employed.

The method consists in placing approximately 2 year old oysters, from northern waters, in baskets or trays supported from 6″ to 30″ above the bottom in suitable southern shellfish areas. The oysters are bare or uncovered at low tide, and covered at high tide. In about 6 months, they attain a size equivalent to that of 5 year old northern oysters.

A well established concern in Virginia has been employing this method successfully for 5 years, with remarkable results. Members of your committee have seen the astonishingly rapid growth attained. Dr. Thurlow Nelson, of the New Jersey Experiment Station and of Rutgers University, showed in experiments on the Delaware shores of Cape May, the phenomenal growth and excellent shape that could be obtained. These demonstrations were made about 1920.[4]

Among the factors responsible for the growth are the following:

1. The oysters are in the upper layers of the water, where the temperature is relatively high and the effect of the sunlight produces a plentiful supply of microscopic food, probably of superior vitamin content because of irradiation by sunshine.

2. The shellfish are above the mud and sand where particles of inert material do not become mixed with the food and cause rejection and waste of food. The oyster rejects what is not considered food on the basis of *size of particles*. Consequently, when oversize sand grains or mud particles get

into its food, the mixture is rejected and the slow process of straining food particles out of the sea water must be started all over again. This rejection hardly ever becomes necessary when the oyster is supported above the bottom. Consequently, the amount of food which the oyster ingests is greatly increased and growth is correspondingly more rapid.

3. Northern oysters, when transferred into southern waters, grow very rapidly. Stimulated by the warm water and the abundant food supply, they function vigorously during the 18 hours they are under water, pumping in and expelling from 40 to 80 gallons per oyster per day.

4. During the period when the shellfish are out of water, they learn to adjust themselves to their new environment. The adductor muscle, which holds the shells in a closed position, is strengthened so that oysters grown in this way stand shipment better than oysters which have not been out of water before. The French refer to this as " educating " or " conditioning " the oyster.

5. The oysters are protected from their natural enemies such as starfish, drumfish, and mud worms. If attacked by drills, they can be readily discovered and removed at low tide.

A suitable area must be selected, protected from storms, in shallow water where stringers supported on stakes or piling can be erected so that they, in turn, can support the trays or baskets. There must be freedom from navigation hazards, proper and abundant food for the oysters, and adequate safeguards from the sanitary standpoint.

The importance of sanitation becomes readily apparent. Suitable areas are usually found near land where most contamination originates. They are found near the mouths of creeks, which bring in much of the food and may bring in contamination also; and they are found in shallow water which warms up readily, but which does not afford much dilution of such contamination as may find its way into the area accidentally. The precautions that need to be observed are similar to those recommended for the protection of shellfish growing areas from which shellfish may be marketed directly or for areas used for the water storage of shellfish, except that vigilance should be increased.

Fecal discharges from employees working in the areas should be buried or otherwise disposed of on shore, in a location and in a manner approved by the state health authorities. Approval of the method of disposal should not be left to local sanitarians or to part-time health officers. A special permit, showing precisely the boundaries within which intensive inshore oyster culture may be practised, should be obtained in each instance from the state health department. Without such permit, it should not be allowed.

The low salinity portions of the area can be used for seed production and the higher salinity areas for growing and maturing grounds. This has been the practice in Delaware Bay for many years.

Details of this method as practised in Virginia are as follows[5]:

Welded steel trays that will deliver a bushel of oysters when they have grown to medium size are used. They are 16 x 40 inches in plan, and 3 inches deep. They are dipped into high temperature tar, such as is used to coat the inside of water pipes. That a serious fire which may destroy the coated trays can occur unless care is used, has been demonstrated by experience.

The trays are supported on heavily creosoted wooden stringers, in such manner that there is at least a 6" space between the under side of the tray and the mud bottom below it.

The trays are set out in rows 30 feet center to center. At low tide, small scows are poled between the rows so that work on the trays and the oysters in them can be done from the decks of the scows. Much labor is required. Each of about 250 oysters is placed on the tray by hand, hinge down. They are held upright by a wooden brace placed in one end of the basket. As the oysters expand because of growth, the tray must be repacked in order to maintain the vertical position of the oysters.

The initial capital investment need not be large. It can be profitable only, however, through the production of high grade stock for the half shell trade which will command good prices. The process is not, in its present state of development, suitable for the production of oysters to be sold to shucking houses at presently prevailing prices. The process may have tremendous potentialities for increased food production if so developed that public confidence in the safety of the product is not impaired. It offers a challenge to members of this Section to develop mechanical labor saving devices which will reduce unit production costs and produce a product of unquestioned purity in great volume. If some member of this Section succeeds in contributing a productive idea to this problem, this report will be considered to have been worth while.

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Nutrition as a Science in Wartime*

Food and Nutrition Section

THE major function of our committee through the years has been to focus attention upon specific areas of research that merit special attention. The present report deals with three topics: (a) the need for certain types of fundamental research through the war period; (b) research that is specifically geared to winning the war; and (c) the need for research that will give a clearer picture of the contribution that nutrition can make to public health.

FUNDAMENTAL RESEARCH DURING THE WAR

In time of war every research program should be critically examined with respect to its demands upon personnel and materials. But such an examination should be conducted with discipline and considered judgment rather than leaving the course of action wholly subject to a natural impulse to drop everything and be off to war.

The following quotation provides a good statement of principle, from President Raymond B. Fosdick's *Annual Report of the Rockefeller Foundation* (1941, p. 7):

> This concern for the future is a matter of stern, practical sense. The specialized talents and abilities that are meeting this emergency and those that will meet emergencies to come are not produced by feverish last-minute activities. No amount of pressure can suddenly create a supply of thoroughly trained and broadly experienced physicists, mathematicians, chemists, biologists, economists and political scientists. These men represent the trained intelligence without which a war cannot be won, or a lasting peace achieved. They emerge . . . out of long, patient, and sustained effort. Pure research, the clean urge to gain new knowledge, the sympathetic appreciation of imaginative scholarship even when it seems remote and unrelated—these we must steadfastly sponsor or our vital intellectual resources will fail us in the days to come.

The science of nutrition is so closely interwoven with other basic sciences and with immediate health problems of the armed forces and civilian groups, that cessation of research, in specific cases, may be too costly in terms of results to justify the transfer of personnel and facilities to immediate war problems. Aid in solving difficult problems relative to personnel deferment has been given in appropriate cases by the Food and Nutrition Board of the National Research Council, through a Committee on Research Personnel, under the Chairmanship of Dr. C. A. Elvehjem.

The following examples may serve to illustrate types of research in nutrition that have been recognized as justified in wartime:

1. Factors that bear closely on blood formation, bone healing, recovery from burns and trauma, shock, and resistance to neuroses
2. Studies of nutrition in relation to chemotherapy, especially with reference to the use of sulfa drugs, arsenicals, and antimalarials

* Report of the Committee on Nutritional Problems.

COMMITTEE ON NUTRITIONAL PROBLEMS
Organized 1919. Published reports: *A.J.P.H.*, Jan., 1920, Feb., 1921, Feb., 1922, Dec., 1924, Feb., 1926, Dec., 1926, Mar., 1928, May, 1929, Nov., 1929, *Year Books* 1930–1931, 1931–1932, 1932–1933, 1933–1934, 1934–1935, 1935–1936, 1936–1937, 1937–1938, 1938–1939, 1941–1942.

3. Isolation and assay of the less stable nutrients in foods, for example the newer vitamins known to be required by guinea pigs and monkeys, but concerning which little is known with respect to human needs

4. Studies of the minimal and optimal human requirement for amino acids, vitamins and other nutrients that are likely to be deficient in military and civilian wartime diets

5. Relations between nutrition and environment, so that physiological principles can be followed with greater assurance beyond the confines of an air-conditioned room, out into the desert, the arctic, and to high elevations

6. Improvement in certain types of bioassays so that food production, processing, storage, and utilization can be measured with greater accuracy and economy

7. Studies of the nutritive value of foods, in cases where such information is critically important to the national and world need

There should be sober recognition of the fact that no one can predict how long the war will last. Planning for munitions and other war supplies cannot be limited to provisions based upon an assumption that the war will end in 1944. Neither can we limit food production and human nutrition plans to accord with such a simple assumption, however attractive. Leaders in research should be first to recognize that as the length of the war increases, the prospect is heightened that relatively fundamental studies will make important contributions toward winning the war. And in addition we must give some consideration to the contributions that will aid humanity in recovering from the war and in setting their faces toward a brighter future. The hazard is very real that within many organizations research planning during the war will be too short sighted with respect to the assignment and training of man power. Even in planning direct war research there is a similar risk of being wastefully hurried in perspective.

A more specific definition of the areas of research cited above may be helpful.

1. *Recovery from trauma*—The provision of "blood banks" is everywhere acclaimed as a major factor in saving the lives and speeding the recovery of soldiers, sailors, and civilians caught in the immediate physical wreckage of war. Less dramatic but significant contributions to the problem of providing for blood regeneration have also been made during the year, giving a better understanding of procedures that can be used to protect military personnel and civilians. Again, the relation of nutrition to the healing of wounds and bone fractures has been clarified by recent work, and there are strong indications that shock and the tendency toward neuroses may be more severe when there is marginal malnutrition.

2. *Chemotherapy and toxicology*—Numerous publications have pointed toward the need for greater consideration of nutritional status during periods of intensive chemotherapy and exposure to toxic chemicals in war plants. Of special interest are the war-essential nitro compounds and industrial hydrocarbon vapors; yet the evidence that has been presented is so fragmentary that nutrition has been given only minor consideration in many manufacturing plants using or producing such products.

There have been numerous indications, too, that tolerance to intense chemotherapy is conditioned in part by marginal degrees of nutritive deficiencies. There are also scattered indications that intense chemotherapy may cause an accelerated depletion of certain nutrients from the body. In view of the current scale of administering sulfa drugs, antimalarials, and arsenicals, it is evident that the need for additional information regarding nutritional aspects of the problem is relatively great.

3. *New vitamins*—The feeding of troops and civilians on restricted types

of rations that must be processed and packaged long in advance, followed by storage in hot climates, involves practical nutritional problems of major magnitude. The losses in ascorbic acid, thiamin, and other known nuutrients can at least be measured, and they are known to be severe; hence they can be compensated for in some degree by supplying synthetic vitamins. But there is good reason to remember that the vitamin requirements of man have not been critically studied. At least one of the newer factors required by guinea pigs is relatively unstable, but practically nothing is known of its content or loss in special rations, nor do we know whether it is required by man. Information of this nature may be very important if the war lasts through another year or two.

4. *Human amino acid requirement*—There has been world-wide concern over the increasing stringency in supplies of high quality proteins, both for direct human consumption and for animal feeds. In addition to the problem of limited supplies, the problem of cost will assume increasing importance. Even in peacetime there is a constant problem of meeting the need for high quality proteins within the price ranges that can be reached by low income groups. Basically the problem of protein requirement is one of supplying adequate quantities of the individual amino acids; yet the evidence concerning amino acid requirements of man and farm animals has been extremely limited. The finest progress made on this fundamental problem has been carried out since the beginning of the war.

5. *Nutrition and environment*—The whole field of human requirements for specific nutrients, in a quantitative sense, has been very inadequately explored. Most of the fragmentary information available at the beginning of the war was based upon environmental conditions typical of comfortable laboratories, and with subjects that were physically and emotionally "relaxed." Conditions typical of military life in the tropics, ski trooper service, high altitude flying, and submarine life, together with extreme ranges in energy output, fatigue, and nervous tension had scarcely been studied in relation to modern concepts in nutrition.

Since the beginning of the war, several laboratories have undertaken intensive studies in each of the above fields, but most of the reports from such projects have been classified as "restricted" by government agencies, so that a recapitulation of the data cannot be made. It should be pointed out, however, that there are still many gaps in the information available to government agencies, and that qualified research organizations having an opportunity to undertake work in this general area could probably receive a certain degree of guidance from the National Research Council.

6. *Bioassays*—Improvements in specificity, accuracy, or time requirement of bioassays contribute so much that there is constant need for intensive effort in that direction. As each factor is identified, the possibility of developing chemical and physical methods of assay is greatly enhanced.

7. *Nutritive value of foods*—Civilian food supplies are likely to become more and more restricted as the war continues and many of the difficulties are likely to persist into the post-war period. Hence our food resources should be developed with special concern for their protection of health, economy of production and distribution, supplemental relation to other foods available, and adaptation to wartime usage. Such a program cannot be developed effectively without regard to the initial nutritive value of our common foods and the retention of nutritive qualities until consumed. Processing, storage, and final preparation

losses should be assessed with care to avoid too great optimism concerning the nutritive value of a given food supply.

Estimations of nutritive intake according to tables that are based upon "edible portion as purchased," involve gross errors. Losses of 30 to 90 per cent of some of the vitamins and minerals from vegetables and fruits during the interval between purchasing and serving are common. It is grossly misleading, therefore, to neglect consideration of the probable or actual content of nutrients in foods "*as consumed.*" On the whole, large scale food processors have been more cognizant of this problem than merchants, housewives, restaurants, hospitals, and other food dispensing agencies. In other words, the need for exploratory types of research on food composition should be carefully balanced against the need for information about losses.

The program of supplying dehydrated foods for use at distant points in the tropics has encountered a series of major difficulties, many of which are nutritional in nature. The exposures to tropical temperatures are too severe for most conventional products to stand up. Losses in flavor, vitamin content, and attractiveness have been greater than expected. Some of the problems are being solved by better control of moisture content, better packaging practice, high sulfite content when processed, and simply eliminating many conventional types of products.

Among the food products that offer great promise for more extensive use in America, special attention should be given to soybeans, because of their high nutritive value and the low cost of production. The horizon for this food item is very bright, but we should not underestimate the seriousness of the snags between production and acceptance.

AVIATION

No other area of war activity seems to be more critical than aviation with respect to victory. The highly specialized field of aviation medicine had only a brief opportunity for development, in the sense of war needs. Two major stresses are frequently imposed on the body during flying: (a) a decreased supply of oxygen and (b) a lowered atmospheric pressure. Added to these stresses frequently are extremes of temperature, intense light glare, night flying, intense acceleration, deceleration and centrifugal stress, prolonged nervous strain, confinement in position, and irregularity of schedule. Those who are familiar with the complexity of physiological adjustments that are demanded by the above stresses can readily realize that there is need for intensive research on the problems, from a nutritional point of view. Chronic fatigue, gas distention, mild and acute anoxia, alkalosis due to hyperventilation, changes in steroid metabolism, impaired vision, diuresis, and changes in excretion of respiratory catalysts are among the recognized disturbances caused by altitude exposure. Obviously there is a reasonable prospect that nutrition would have a bearing on the body's performance under the influence of such stresses, and there is an obligation upon research laboratories to help find answers to the many questions that are involved, whether they work from wartime or peacetime motives. The latter point is mentioned because it is felt that clear provision should be made for the coöperation of the Selective Service Office in making arrangements for men classified as conscientious objectors, to serve as experimental subjects on government sponsored research projects. The contribution of such studies to protection of civilians and the advancement of aviation medicine is very real.

Influence on temperature—There have

been relatively few studies to indicate the optimum proportions of protein, carbohydrate, and fat for the best maintenance of physical vigor in such areas as the tropics and the arctic. Nearly all of the data available with respect to diet and working efficiency have been obtained under moderate conditions of environmental exposure. There is a good theoretical basis for expecting differences in performance in response to variations of the above type.

A number of papers have given preliminary indications of higher requirements for the water soluble vitamins when men are exposed to high temperatures. The evidence available is extremely fragmentary, however, and not in agreement as reported from different laboratories.

Long before the war it had been generally accepted that exposures to high temperatures made necessary a higher intake of salt to balance excessive losses in perspiration. Observations in mines and mills had led to routine provision of extra salt for workmen. A number of the related problems had not been adequately solved, however, in a manner that would meet the requirements of either the civilian or military personnel operating in tropical areas. Even the quantitative correlation between salt requirement and perspiration had not been established satisfactorily as a basis for maintaining optimal work output, nor was there clear evidence with respect to the best manner of administering the added supplies of salt. Some physicians advocated salt pellets, others advocated salt in the drinking water, and still others preferred to supply salt with the regular food intake. Tests carried out since the war began make it clear that there is a difference in the performance of men, depending upon the method of administering salt.

Thirst—Desert operations and provision for stranded groups, such as may occur on life rafts, often make it necessary to utilize with utmost efficiency limited and inadequate supplies of water and food. One will not find in the literature adequate evidence to indicate the most efficient manner of utilizing limited supplies for maintaining survival.

Partial inanition—Neither is there adequate information with respect to the optimal composition of foods that should constitute emergency rations where there is a prospect of prolonged caloric insufficiency. The proportions of carbohydrate, fat, and protein, and the content of minerals and vitamins would almost certainly have a bearing upon survival through prolonged periods of diminishing food supplies.

Shock—The possible influence of special dietary regimes to afford optimal conditions for recovery from shock, or resistance to the stresses that induce shock, such as trauma, severe hemorrhage, explosions, and exhaustion, has not been explored to the degree that the importance of the subject seems to justify.

THE PUBLIC HEALTH ASPECTS OF NUTRITION

Among research workers who have studied most carefully some of the relationships between nutrition and health in experimental animals under rigidly controlled conditions, there is considerable confidence that improved human nutrition, well above the levels that protect against deficiency diseases, would contribute in a very significant way to better public health. Many physicians and students of public health are in agreement with that point of view. Nevertheless it must be granted that the amount of evidence obtained under satisfactorily controlled conditions is relatively inadequate, and that as a result many professional people in such fields as medicine, public health, education, industrial management, and civic

administrations are not fully convinced of the importance of nutrition.

Among the more significant clinical studies in recent years may be cited the study by Burke, Beal, Kirkwood, and Stewart; earlier studies by Ebbs, Scott, Tisdall, Moile, and Bell of Toronto; and the reports by Sir John Orr and his associates in England. If the relationship between diet and health that is indicated by the above three studies holds for a large proportion of our population, then the entire subject of nutrition, both from a research and from an applied point of view, would seem to merit a much larger degree of attention than it has received.

Among the public health areas of study that would seem to afford great promise for nutrition research, the following may be cited:

1. Maternal nutrition in relation to the health of mothers and infants
2. Infant nutrition in relation to both physical and mental development
3. School and community feeding programs that will provide for better nutrition during childhood and adolescence
4. Adult nutrition as a means of maintaining a more satisfactory level of health, particularly with respect to protection against metabolic and neurological disturbances that commonly accompany approaching old age. The latter field of research has scarcely been touched, even though there has been a considerable expression of interest in the "science of geriatrics," and a few groups have been organized to give the subject more intensive consideration.

There is general agreement that the current incidence of dental caries in America and in nearly all other sections of the civilized world constitutes a health impairment of very great importance. There are many different theories with respect to the major factors involved, but there is little clear-cut evidence that is generally acceptable to critical students of the problem. With a record of approximately one man in five rejected because of dental defects, of those rejected on physical examination for the United States Army during the early period of the war, concrete evidence was provided concerning the importance of the problem. Many other studies have been reported in the literature to supplement the observations with respect to men called for military service.

Three great difficulties have stood in the way of progress in studying human nutrition: (1) the lack of adequate controls during the course of observation; (2) the shortness of time during which careful observations have been made (e.g., in contrast, Professor Sherman's rat experiments now correspond roughly with human time reaching back to the reign of the Caesars); and (3) the relatively high cost of conducting well controlled experiments. With adequate interest and planning, however, it should be possible to overcome enough of the handicaps to secure the information that is most critically needed.

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Food Conservation*

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THIS country has never faced a more critical period in respect to its food supplies than the months and years immediately before us. Despite an abundance of many United States food crops during the past two harvest seasons, with the highest levels ever reached, our obligations to feed our armed forces, our civilian population, and materially aid our Allies and the population of such other areas as may be necessary, will cause an unprecedented demand on every type of available food supply.

A part of this demand may be met by additional emphasis on food production. With the limitations of man power, agricultural equipment and supplies which exist due to the war effort, this approach to the problem, worthy as it is, cannot be expected to provide a complete solution.

We must also embark on a planned program of food conservation, worldwide in scope, geared to recent and accurate scientific information concerning food utilization in the most efficient and least wasteful methods. Such a program must start on the farm where crops are planned and planted for specific purposes, and end not at the table as in the past but at the chemical plant where wastes of the table are reconverted to foods, feed, or fertilizer for further use in growing more foods.

Such a program will be intimately concerned with the health and morale of our population, the economic status of our citizens, and the success and timeliness of our war effort, because foods are no longer only foods. Foods are also to a considerable extent the raw materials of our munitions industries, our textile industries, our plastics industries, and others. Our pharmaceutical industries depend on foods for the raw material source used as the basis for the production of the new and vitally important drug, penicillin, which has shown such remarkable life-saving properties.

Recent developments in the field of nutrition indicate that much could be done to improve the diet of a large percentage of our population without making changes which are either restrictive or unpleasant. With the strides which have recently taken place in respect to vitamins and proteins, we are much better equipped to supplement the gaps in nutritional inadequacies by the use of simple foods and by-products of peanuts, soybeans, and the dairy industry. The residues of cereal germs after removal of their valuable oils have attained recognition as valuable potential foods for man as well as feeds for meat-producing farm animals.

The hydrolysis of protein residues gives promise of additional amino-

* Report of the Committee on Foods (Except Milk).

COMMITTEE ON FOOD (EXCEPT MILK)
Organized 1932. Published reports: *Year Books* 1933–1934, 1934–1935, 1935–1936, 1936–1937, 1937–1938, 1939–1940, 1940–1941.

acid containing foods of high biological value.

Adequate conservation of our food supplies will require the leadership of our most inspiring and able workers in every profession, including medicine and public health. It will require the understanding and coöperation of every man, woman, and child in this country and in others. To accomplish the goal will require the greatest mass effort in health education that has ever been projected. It can pay dividends in the improved welfare of our people and, simultaneously, contribute in a large way to the war effort.

Some of the factors concerned in the effective formulation of such a program are the following:

1. Conversion of agriculture to crops which produce
 a. More food per unit of area
 b. More nutritious foods per unit of area
 c. More food per unit of man power expended in production
2. The consumption of smaller total quantities of food without losing nutritional value by
 a. Better choice of foods in the diet
 b. Elimination of inefficient foodstuffs
 c. Insuring that those who get too much food use less, and those who are on a poor diet get more of the needed commodities
 d. Wider utilization of food by-products of high nutritional value
3. The prevention of food losses, caused by
 a. Improper storage—absence of refrigeration
 b. Poor and possibly unsafe processing methods
 c. Poor packaging methods causing wastage
 d. Improper and excessive cooking which lowers vitamin content
 e. Faulty use of prepared foods, such as discarding cooking water
 f. Preparation of excessive quantities of food for the number of persons to be fed
 g. Ignorance of means by which food residues may be used in other forms
 h. Plate waste—the serving of more food than an individual can utilize at the time
 i. Waste of fats which may be salvaged either in the kitchen or by installing grease traps in larger institutional cooking establishments
 j. The possible extension of garbage disposal facilities in municipalities with fat recovery—or garbage feeding of swine
 k. Failure to consider the enormous food savings involved in meat cutting and trimming in centralized agencies where all excess fat and bones may be rendered for subsequent food uses
 l. Failure to consider the food wastage involved in feeding domestic pets which are consuming food that could feed thousands of humans

No doubt there are other considerations involved which are equally important. If each of these mentioned were thoroughly studied, however, and if every member of this Section and this Association were to expend his own utmost endeavors to correct such defects and help to activate a moving program along such lines, it would result in a great boon toward victory, toward better health for more people, and to a better world in the future.

A start in this direction could be made by the collection and publication of data on food losses by the members of the Food and Nutrition and the Laboratory Sections. The Health Education Section could coöperate in the preparation of proper media for the presentation of such information to the public. The Governing Council could collaborate with and aid those government agencies which are concerned in various phases of this type of food conservation.

It is the recommendation of this committee that a resolution be presented to the Governing Council of the Association indicating the desirability of a national food conservation campaign and the willingness of this Association to sponsor and contribute in every possible manner to the fulfillment of any program or duties

relating to the same which would facilitate the conservation of food in the war effort.

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West Indian Conference of the Anglo-American Caribbean Commission

The West Indian Conference of the Anglo-American Caribbean Commission was held in Barbados, British West Indies, during the period March 21 to 30, 1944. The meeting was attended by a large group of delegates and technical advisers from British and United States territories in the West Indies, in addition to members and advisers of the British and United States Sections of the Commission. Observers were sent by the Netherlands and the Canadian Governments.

Of the six general topics considered, three related to medicine and public health. These were: (1) Health protection and quarantine, (2) the planning of public works and thereby the provision of better facilities for environmental sanitation and medical care, and (3) the establishment of a section on public health and medicine of the Caribbean Research Council.

II. Vitamin B Complex

Status of Assay Methods and Need of These Substances by Man*

Food and Nutrition Section

THE three most widely used members of the vitamin B complex were discussed in detail in the last prepared Committee Report given at the Detroit meetings in October, 1940.[1] Since that time clinical and laboratory findings have further elucidated the deficiency diseases resulting from lack of thiamin (B_1), riboflavin (B_2), and nicotinic acid (niacin). In fact, the diseases resulting from a lack of one or more of the above were known before the individual vitamins were isolated and synthesized. However, once this was accomplished, great progress was made in the matter of assays either by microbiological or physico-chemical methods. This meant a great saving in time as the application of such technic obviated the necessity of long-time animal assay methods. Since more refined assay methods are available and quicker results may be obtained more work accrues.

Since the last committee report on this subject was rendered,[1] considerable progress has been made in assay methods, and the need for the various components in the diet of man revealed. Newer members have been added to the B complex so that a summary of each individual component with status of assay methods and needs for the diet of man seems to be in order.

THIAMIN (B_1)

Thiamin hydrochloride is a white, crystalline substance, readily soluble in water, possessing a nut-like, salty taste, and yeast-like odor. The empirical formula is $C_{12}H_{18}N_4OSCl_2$.

In foods and tissues it occurs in the free form and as thiamin pyrophosphate or cocarboxylose. In the latter form it functions in the living cell as a coenzyme in carbohydrate metabolism. In thiamin deficiency the metabolism of sugar is incomplete and pyruvic acid accumulates in the tissues. This gives rise to toxic symptoms, a condition which is used clinically in determining thiamin insufficiency. Many of the symptoms which have been observed in beriberi may be related to faulty carbohydrate metabolism, although it is still difficult to differentiate an uncomplicated thiamin deficiency from multiple deficiencies.

The variety of symptoms seen in man has been summarized by Spies and Williams[2] and by Jolliffe.[3] Wilder[4] has pointed out that the type of symptoms which develop depends to a considerable extent on the rate at which the deficiency develops, but he states that in all cases the subjects become depressed, irritable, quarrelsome, uncooperative, and fearful. An anemia of the hyperchromic type has also been

* Report of the Committee on Assay of Foods

COMMITTEE ON ASSAY OF FOODS
Organized 1934. Published reports: *Year Books* 1935–1936, 1938–1939, 1940–1941.

described in a number of thiamin deficient patients.

The official method for the estimation of thiamin is the rat assay procedure described in the U.S.P. XII. Since our last report, both the thiochrome [5] and yeast fermentation [6] methods have been widely used and commented upon. Recently the thiochrome method [7] has been adopted by the U.S.P. and sanctioned for thiamin determination in addition to the rat assay technic. The thiochrome and yeast methods have the advantage that they are quicker and can be used for substances of low thiamin content.

Because of the fact that significant amounts of thiamin may be lost during the preparation of foods, due to the ready solubility of the vitamin in water and lability to heat, it is suggested that food tables be consulted and the minimal value in these tables be used in computing the amounts of this dietary factor.

RIBOFLAVIN (B_2)

Riboflavin is an orange-yellow, crystalline compound, showing a characteristic yellow-green fluorescence in aqueous solution. The vitamin is rather heat stable, especially in acid media, but extremely labile when exposed to light. The empirical formula is $C_{17}H_{20}N_4O_6$. In nature riboflavin may exist as such or as riboflavin phosphate, or as a constituent of specific flavoproteins, the latter functioning as important enzymes in tissue respiration. With a deficiency of riboflavin a definite reduction in tissue concentration of the enzyme has been shown.[8]

The symptoms of riboflavin deficiency syndrome [9] in man may be divided into three groups: A. Ocular Symptoms, B. Oral Symptoms, C. Skin Lesions.

In regard to the ocular symptoms, photophobia and interference with vision follow. With the earliest changes seen in the eye is a growth of capillaries into the cornea. These fine capillaries cross the sclerotic and go into the cervix of the cornea. They can be seen only by the slit lamp microscope. A corneal microscope is required in order to see those vessels steadily enlarge and proliferate into the cornea until a lesion develops which can be seen grossly, and superficially may appear to be a conjunctivitis. As a lesion progresses cloudiness of the cornea develops and in some instances opaque spots or even corneal ulcers may occur. Following the use of riboflavin, these lesions in most instances have completely disappeared, and there is recovery to nearly normal vision. If the lesion is of several years' standing, more time will be required; however, remarkable improvement has taken place in a few days to a week or two.

The oral lesions are largely confined to both lips, in which there is a shiny denuded appearance, and the lips appear to be chapped in many instances. In the corner of the mouth appears a white spot which breaks down. Following this, a transverse fissure in each angle of the mouth appears. It may extend onto the face, covered with a dry, yellowish secretion. If this is removed, a raw, ulcerated crack will be found underneath. The line of closure of the lips becomes quite red and very shiny and glistening. The tongue is discolored, being described as magenta in color, or pulplish red, differing from the red tongue of niacin deficiency. Lesions of riboflavin deficiency appear in the eyes and in ulcerated lesions just inside the nares, frequently on the ears, in the folds of the body, in the groin or under the arms.

The riboflavin content of foods may be determined by measuring the growth response obtained in chicks or rats maintained on basal rations low in the vitamin, but the more rapid microbiological method of Snell and Strong [10]

is now finding wide application, and has been accepted by the U.S.P. as official.[11] Chemical methods involving measurements of fluorescence are also being used.[12, 12a]

Riboflavin is widely distributed in plant and animal material. Liver, milk, and vegetables may be considered the best and most reliable sources in the human dietary. One serving of liver or one quart of milk adequately meets the human daily requirement.

NICOTINIC ACID (NIACIN)

Nicotinic acid occurs as white, needle-like crystals, is non-hygroscopic and stable in air, possessing a bitter taste, and has the empirical formula $C_6H_5O_2N$. The sensation of flushing and erythema of the skin often observed on administration of nicotinic acid is not produced by nicotinic acid amide. Nicotinic acid is a comparatively weak acid and its alkaline salts in solution show a slightly alkaline reaction. It is stable to autoclaving temperature when in solution and shows no loss of activity when exposed to dry heat.

Because of numerous objections to the term nicotinic acid, niacin and niacin amide have been proposed and widely accepted.

In the body niacin functions as a component of two important coenzymes, coenzyme I or cozymase, and coenzyme II, which are concerned in both glycolysis and respiration.[13] In niacin deficiency it is possible to demonstrate a decreased cozymase content of liver and muscle tissue. The early symptoms of pellagra are dermatitis, weakness, lassitude, anorexia, mental depression, and indigestion, followed by sore and ulcerated mouth and diarrhea. However, Goldberger's classical description of pellagra (*Tice Practice of Medicine*) should not be overlooked. More detailed summary of symptoms has been recently made by Harris,[14] and by Youmans.[15] Spies, Walker, and Woods[16] have shown that infants and children also suffer from nicotinic acid deficiency in areas where pellagra is endemic, although typical lesions are seldom seen in infancy. Nicotinic acid is now widely used in the treatment of pellagra but its use is most successful in conjunction with other vitamins and specific natural foods.

Since nicotinic acid is not required preformed in the diet of the rat, the dog, originally used by Goldberger and his coworkers for the assay of the anti-pellagra potency of foods, is the only animal that can be used with any success. Fairly accurate values can be obtained by comparing the growth response obtained by feeding a definite weight of food with that obtained after giving a standard dose of nicotinic acid.[17] Chemical methods may be used on many foods and an improved method has recently been described by Dann and Handler.[18]

A convenient and apparently satisfactory microbiological method has been described by Snell and Wright.[19] In general there is a good agreement between results obtained with the three methods except in case of liver and kidney. The values obtained with the dog assay for these materials are somewhat higher than the values obtained by chemical or microbiological methods. The best sources of nicotinic acid include liver, yeast, and lean meats.

The existence of the remaining members of the B complex is based largely upon work with animals and the use of these factors in practical nutrition is not too clearly understood. This does not mean that these newer factors are not essential in the metabolism within the body, but the corresponding deficiency diseases are not so apparent. This situation may be due to several factors: first, the recognition of the additional B vitamins is so recent that extensive clinical studies have not been

made; second, these factors are so widely distributed in a variety of foods that a serious deficiency is less likely to occur; and third, some of them at least are produced in the intestinal tract by bacteria.

PYRIDOXINE (B_6)

Two additional compounds, namely, pyridoxine and pantothenic acid, were added to the B complex between 1938 and 1940. Pyridoxine was recognized through its ability to prevent a dermatitis in rats which was observed during attempts to produce experimental pellagra in rats. It was first obtained in crystalline form in 1938, and its synthesis was described by Harris and Folkers [20] shortly thereafter. Pyridoxine hydrochloride is a white crystalline powder, slightly bitter in taste and odorless, possessing the following empirical formula: $C_8H_{12}O_3NCl$.

Pyridoxine deficiency in the rat has always been associated with a specific dermatitis called acrodynia by György,[21] although it has been demonstrated [22] that a lack of this vitamin may cause retarded growth without the dermatitis if ample fat is supplied in the diet. It appears [23] that linoleic acid, pyridoxine and pantothenic acid are together concerned in the prevention of dermatitis. Chick and coworkers [24] reported convulsions in pyridoxine deficient rats and pigs resembling epileptic fits in man. Convulsions in dogs were observed by Fouts, et al.,[25] and Wintrobe [26] has recently described convulsions in pigs on pyridoxine low diets.

A microcytic hypochromic anemia also results from a chronic pyridoxine deficiency in dogs [27] and pigs.[26] The hemoglobin and the red cells decrease progressively, the hemoglobin relatively faster than the red cells. Addition of pyridoxine causes a larger reticulocyte response, with rapid increase in hemoglobin and red cells until the normal level is attained. Rats,[28] pigs,[29] and to some extent dogs [30] excrete in the urine a green pigment when on diets low in pyridoxine. Lepkovsky, et al.[31] have now identified this compound as xanthurenic acid and have shown the compound to originate from dietary tryptophane. These and other results indicate that pyridoxine may be closely related to protein metabolism.

No clear-cut symptoms resulting from pyridoxine deficiency have been described in man. Spies, Bean, and Ashe [32] have reported an additional improvement in pellagrins by giving pyridoxine after treatment with nicotinic acid, riboflavin, and thiamin. Smith and Martin [33] observed a rapid and satisfactory healing of the typical lesions of cheilosis with vitamin B_6 therapy. Although clinical treatment of such conditions as Parkinson's disease, muscular dystrophy, and paralysis agitans has been studied, the results are not definite enough to associate any one of these syndromes with specific lack of pyridoxine in the diet. Pyridoxine administration has been reported to have been used with some success in reduction in the oiliness of the skin in cases of acne.[34]

The human requirement is unknown but animal experiments indicate that it may be about the same as thiamin, namely, 1 to 2 mg. per day. In fact, the vitamin B_6 requirement of chicks is higher than that for thiamin, 300γ B_6 per 100 gm. ration. There appears to be no difficulty in meeting this requirement because of the wide distribution in foods. Swaminathan [35] found diets consumed in India to supply 3.5 to 5.0 mg. per day. Chemical methods have been used for the estimation of vitamin B_6 but the rat growth method is still the most reliable. The yeast method [36] has been found to give results comparable to those obtained with rats. Among the best sources of vitamin B_6 are rice bran, liver, yeast, cereals, legumes, and milk.

PANTOTHENIC ACID

Pantothenic acid in the form of calcium pantothenate became available in 1940. The term " filtrate factor " was used for several years to designate that fraction of the B complex which prevented dermatitis in chicks. Although the so-called filtrate fractions from liver extract were effective in the prevention of black tongue in dogs, pellagra in man and dermatitis in chicks, it was recognized as soon as nicotinic acid was accepted as the antipellagra factor that the activity of these fractions for the chick was not due to the nicotinic acid present but to a separate and distinct vitamin. Woolley, Waisman, and Elvehjem [37] and Jukes [38] independently demonstrated that pantothenic acid, which Williams [39] had shown to be a growth factor for yeast as early as 1933, was similar to the chick antidermatitis factor. The complete synthesis of calcium pantothenate which has the empirical formula $(C_9H_{16}NO_5)_2Ca$ was achieved by Stiller, et al.[40]

Rats placed on diets low in pantothenic acid grow very poorly and in a few weeks develop necrosis of the adrenal cortex, a condition first described by Daft and Sebrell.[41] When black or piebald rats are used, significant changes in hair pigmentation (graying) can be observed. Unna, et al.[42] have published photographs of these fur changes in nutritional achromotrichia. Ralli and Graef [43] have shown that adrenalectomy will cause an increase in the deposition of melanin in the hair bulbs and follicles of rats showing graying due to filtrate factor deficiency.

Acute pantothenic acid deficiencies in dogs [44] are characterized by sudden collapse, associated with decreased blood dextrose, increased non-protein nitrogen, and lowered blood chlorides. Severe intussusception in the intestinal tract and fatty livers have also been observed. Scudi and Hamlin [45] found a lowering of blood lipids to accompany the occurrence of fatty livers. Hughes [46] and Wintrobe [47] have described the following symptoms as occurring in pigs on a pantothenic acid deficient ration: slow growth, rough coat, loss of hair, ulcers in the intestinal tract, and a " goose stepping gait " as a result of pantothenic acid deficiency in pigs. Phillips and Engel [48] found specific neuropathologic changes in the spinal cord of chicks suffering from pantothenic acid deficiency and Wintrobe [47] has described sensory neuron degeneration.

In spite of these interesting symptoms in experimental animals, little is known about the importance of this vitamin in human nutrition. Spies and his coworkers [49] concluded from studies based largely on blood pantothenic acid values that it may be essential in human nutrition. Gordon [50] found the average daily excretion for 40 subjects to be 3.5 mg. The daily human requirement may fall within 5 to 10 mg. per day.

The pantothenic acid content of foods may be measured by growth experiments with chicks, but the microbiological methods [51] are now in more general use. Liver is one of the richest sources, containing about 5 mg. per 100 gm. of fresh liver. Meats, cereals, and milk are also reliable sources. Brandaleone, et al.[52] have recently reported that in a group of 19 elderly individuals with gray hair a significant color change was noted in only 2 individuals during intensive therapy with calcium pantothenate, para-aminobenzoic acid and brewers' yeast.

CHOLINE

Although there may be some question about the propriety of the inclusion of choline in the discussion of the vitamin B complex, the fact that choline is now added to most of the purified diets used in vitamin studies suggests that

it is logical to discuss its nutritional significance along with this group of compounds. Choline has been recognized for many years as a component part of phospholipid lecithin, but its possible need in the diet was not apparent until Best demonstrated its rôle in the prevention of fatty livers in depancreatized dogs.[53] The one function of choline is related to the mobilization of fatty acids in the body, since in its absence liver fat accumulates rapidly. Fatty livers in rats induced by feeding high cholesterol diets do not respond to choline treatment. The observations of duVigneaud and his collaborators [54] that the methyl groups of choline as well as those of methionine and betaine are transferable in the animal organism has led to the conclusion that another function of choline is to supply labile methyl groups. McHenry [55] states that there is evidence now that choline may function in at least three ways: to stimulate the formation of phospholipids, to make possible the production of acetyl choline, or to supply labile methyl groups.

Jukes [55] has shown that choline is one of the factors required in addition to adequate manganese to prevent slipped tendons or perosis in young turkeys. Depression of the growth rate when choline is omitted from the diet has been observed in the case of the rat by Richardson, et al.,[56] in the chick by Hegsted, et al.,[57] and in the dog by Schaefer, et al.[58]

The high requirement of the young rat for choline has been stressed by Griffith [59] who previously reported fatty degeneration of the liver, hemorrhagic renal lesions, ocular hemorrhages, and regression of the thymus within ten days after the rats had been placed on a low choline but otherwise adequate diet. Cirrhosis of the liver in rats fed diets low in choline and protein has been reported by György and Goldblatt,[60] Blumberg and McCollum,[61] Webster,[62] and Lowry, et al.[63] The results of these studies have been summarized in *Nutrition Reviews*, Vol. 1, p. 88 (Jan.), 1943.

Fouts [64] has described fatty cirrhotic livers in dogs receiving the B vitamins in synthetic form without choline. Partial clinical improvement followed the administration of large amounts of choline, but combined administration of choline and liver extract produced more rapid improvement, although fibrosis of the liver still persisted. Some success has been reported with choline in the treatment of portal cirrhosis in man (Brown and Muether [65] and Fleming and Snell [67]), but the workers suggest that improvement is possible only when hepatic damage is not too far advanced. With the present necessary modifications in the protein and fat sources in the human diet it is well to consider the foods which can be depended upon to supply choline. Meats, cereals, vegetables, and eggs are good sources of choline. The choline content of a number of animal and plant products has recently been tabulated by Engel.[67]

Reactions which have been used for the determination of choline include its oxidation to trimethylamine,[68] the formation of an insoluble complex with iodine,[69, 70] the isolation of the choloroplatinate or chloroaurate,[71, 72] and the precipitation of choline as the reineckate.[73] In the latter method choline reineckate is separated from other reineckates by virtue of its insolubility in water and ethyl alcohol. When dissolved in acetone, it forms a red solution which can be measured colorimetrically. A method based on this reaction was studied in detail, either the Bausch and Lomb spectrophotometer or the Evelyn photoelectric colorimeter being used to measure color intensity. Application of the latter method to rat tissue was reported by Jacobi, et al.[74]

BIOTIN

Biotin has been recognized as necessary for the growth of microörganisms for some time, and its significance in the nutrition of animals has been elucidated within the past year or so. Biotin was first isolated in 1936 by Kögl and Tonnis [75] but its complex nature and its minute concentration in natural products delayed identification of its structure. duVigneaud and coworkers [76] have recently shown that biotin has the following empirical formula: $C_{10}H_{16}O_3N_2S$. Biotin is a stable compound, resisting autoclaving with strong mineral acids, and in the form found in natural products is but slowly inactivated with strong alkali. It is readily destroyed by oxidizing agents.

It has been known for many years that a characteristic syndrome can be produced in rats fed diets containing high amounts of raw egg white. Lease, Parsons, and Kelly [77] found that the rabbit and the monkey also exhibited a typical dermatitis when fed rations containing egg whites. As early as 1933[78] Parsons concluded that the injury involved an interrelation between a positive toxicity and a relative absence of a protective factor, and a little later György named this factor vitamin H. Birch and György [79] obtained highly potent concentrates of the factor, and in 1940 duVigneaud, Melville, György, and Rose [80] suggested the identity of biotin and vitamin H.

György, Rose, Eakin, Snell, and Williams [81] have now established the presence of "avidin" (an albumin) as the biotin inactivating factor in egg white. Thus it becomes apparent that egg white injury is due to the unavailability of biotin by virtue of being tied up with avidin, in which complex biotin cannot be absorbed from the intestine and is excreted in the feces. Nielsen and Elvehjem [82] using a more complete ration than had been used in the early work, were able to demonstrate a biotin deficiency in the rat fed 10 per cent levels of egg white. Typical symptoms of "spectacled eye," progressing to general alopecia and in the later stages the onset of a spasticity and final death of the animal, were recorded. Even the severe symptoms of spasticity were cured when excess biotin (in excess of that which unites with the avidin) was added to the diet. On the synthetic diet without the egg white these workers were unable to demonstrate any signs of biotin deficiency and it seems probable that under most conditions the rat can synthesize, through the medium of bacteria in the intestine, sufficient biotin for its requirement. Biotin deficiency has been reported in the chick without resorting to egg white diets, which seems to indicate that very limited synthesis of biotin in the intestinal tract must prevail. A typical dermatitis involving the feet was found by Hegsted, et al.[83] to be characteristic of the deficiency in the chick, and Patrick, et al.[84] also have noted similar dermatitis with turkeys on biotin deficient rations.

Rather definite information is available regarding the importance of biotin in human nutrition. Sydenstricker and coworkers [85] produced a deficiency in man by feeding egg white at a level which supplied 30 per cent of the calories. Symptoms of dermatitis developed as early as the 3rd and 4th weeks, and other symptoms similar to those seen in thiamin deficiency were observed. All symptoms were cured by the parenteral administration of 150–300γ of biotin per day. Oppel [86] has shown that the biotin content of the urine is influenced by the amount in the diet. Most of the normal subjects excreted 20–50γ per 24 hours and he was unable to find a single patient that did not excrete biotin. Sydenstricker's patients receiving egg white showed levels at low as 3.5γ per day. Oppel

also reported that diets of average composition contained 30 to 40γ per day or 10 to 16γ per 100 gm. dry food. The latter value is interesting because the biotin requirement of chicks is 7 to 10γ per 100 gm. of ration.[83] When the biotin content of the feces was also determined the total biotin output was 3–6 times as great as the intake from the diet. Thus there is apparently intestinal synthesis of biotin in man as well as in the rat. The intake of biotin in the diet may not be important except in special cases. It should be kept in mind, however, that a lack of some of the other B vitamins may cause deficiencies due to reduced synthesis of biotin, as well as a deficiency due to a direct lack of the vitamin in the body tissues.

Biotin can be conveniently determined by use of microbiologic methods of assay in which responses in yeast growth (Snell, Eakin, and Williams [87]) or acid production by *Lactobacillus casei* (Shull, Hutchings, and Peterson [88]) are measured. Biotin is almost ubiquitous in distribution, but liver, kidney, yeast, and egg yolk are the chief sources. It is to be emphasized that in most tissues biotin is present in a "bound" state in which it cannot be extracted by hot water, and autolysis or acid hydrolysis must be employed to realize the true concentration of biotin in these instances.

INOSITOL

The significance of inositol in animal nutrition was first recognized through the use of the mouse. Eastcott showed as early as 1928 that inositol would stimulate the growth of yeast. In 1940 Norris and Hauschildt [89] found that mice failed to grow on a synthetic diet containing the known members of the B complex. In addition to lack of growth, the animals showed loss of hair and scaly dandruff. Liver and yeast supplements produced normal animals. Woolley [90] described a similar condition and identified the factor in the yeast and liver as inositol. Further studies [91] indicated that some of the animals without inositol showed spontaneous cures. Cultures from the intestinal tract of the mice showing the spontaneous recovery yielded organisms which would synthesize much more inositol than cultures taken from the tract of mice that remained hairless. This synthesis was not observed when pantothenic acid was absent from the diet. Since no one has been able to demonstrate the need for inositol in the diet of growing rats, there is apparently sufficient synthesis by the bacteria to meet the requirement. Whether this is true in man remains to be determined.

Inositol can be determined in tissues and foods by using a microbiologic assay employing a specific strain of yeast as the test organism.[92] By this method of determination, Williams and his coworkers [93] have made large numbers of assays on various rat and beef tissues and found spleen, heart, kidney, brain, thyroid, and testes to be especially high in inositol. As previously mentioned, inositol in the form of phytin is present in large amounts distributed throughout the plant kingdom; cereal brans and seeds are exceptionally good sources. No work has been done on the possible significance of inositol in human nutrition.

PARA-AMINOBENZOIC ACID

Para-Aminobenzoic acid was first described as a bacterial growth factor by Rubbo and Gillespie [94] and Ansbacher [95] concluded it was a vitamin in 1941. Sieve [96] has used it as an achromotrichia factor. The fact that this compound is widely distributed in nature suggests that it may be an important vitamin. In the chick it can partially compensate for the lack of liver extract factors when fed at high levels. Thus it may have an indirect

effect by altering the synthesis of other factors in the tract. Martin [97] has reported similar results in the rat and suggests that it may have such an effect in man.

OTHER FACTORS

In order to study still other possible members of the B complex it has been necessary to use rats receiving sulfaguanidine or succinyl sulfathiazole, or chicks and monkeys on synthetic diets containing the nine B vitamins mentioned so far.

If 0.5 per cent sulfaguanidine or succinyl sulfathiazole is added to a synthetic diet containing thiamin, riboflavin, nicotinic acid, pyridoxine, pantothenic acid, and choline and fed to rats, the rate of growth is greatly reduced and the prothrombin time of the blood is increased. The addition of liver extract to this ration gives optimum growth and normal clotting time of the blood.[98] The liver extract can be replaced by a folic acid concentrate and biotin.[99] Thus the rat requires biotin and one or more factors in the folic acid concentrate, but under normal conditions these factors are produced by the intestinal bacteria. Gant, et al.[100] have shown a reduction in the coliform organisms in the tract of rats upon feeding succinyl sulfathiazole. Spicer, Daft, Sebrell, and Ashburn [101] have reported a consistent development of a leucopenia and an agranulocytosis in rats receiving sulfaguanidine or succinyl sulfathiazole in synthetic rations. The total number of leucocytes dropped from a normal of 10,000 to less than 1,000 in severe cases.

Chicks fed a modified synthetic diet plus the synthetic B vitamins, including biotin and inositol, not only fail to grow but show very poor feathering and a rather extensive anemia.[102] All three deficiencies can be counteracted by adding 2 per cent liver extract or 5 per cent yeast to the diet and all the activity can be concentrated in crude folic acid preparations from these foods. Similarly monkeys fail on synthetic diets but live and develop normally if liver extract, grass juice powder, or a crude folic acid preparation is used.[103]

VITAMIN M

When given a diet deficient in the B vitamins, rhesus monkeys develop a syndrome characterized by anemia, leucopenia, oral lesions, diarrhea, and susceptibility to bacillary dysentery.[104–114] The syndrome cannot be prevented or cured by any combination of the now commercially available pure vitamins, but can be prevented, and sometimes cured, by yeast, fresh liver, and certain crude liver extracts. The term "vitamin M" was proposed for the nutritional factor.[106] There is evidence that xanthopterin may partially or completely protect the monkey against this nutritional cytopenia when fed in combination with the other available B vitamins.[115] It has also been reported that "folic acid" concentrates are active in correcting the anemia and leucopenia in this experimental condition in the monkey.[112, 113] Since "folic acid" concentrates appear to contain xanthopterin [116] it is not clear whether this activity is due to the "folic acid" as such, or to the xanthopterin, or to a combination of the two. There is some evidence of a biological nature for a relationship between "folic acid" and xanthopterin.[117] Until the exact relationship between "folic acid," xanthopterin and "vitamin M" is clarified it will not be possible to use the microbiological method for "folic acid" [118] as a measure of "vitamin M."

At the present time the only specific assay method for "vitamin M" is the bio-assay based upon the protection of the monkey against nutritional cytopenia, or the cure of nu-

tritional cytopenia. The protective method is laborious as it is necessary to protect a monkey for approximately a year in order to demonstrate the effectiveness of a supplement. The curative technic is not always satisfactory, as the monkeys enter an irreversible phase if the deficiency is allowed to progress too far.

It is evident therefore that the remaining members of the B complex can be concentrated in a crude folic acid concentrate. Most of these preparations have been made according to the procedure described by Hutchings, Bohonos, and Peterson.[119] These workers used the *Lactobacillus casei* for the assay of the activity. Mitchell, Snell, and Williams[120] used spinach as the source of their factor and the *Streptococcus lactis* as the test organism. They named the factor folic acid and found a rather pure concentrate to stimulate the growth of *L. casei* as well as *S. lactis*. For some time the two factors were considered to be the same, but very recently Keresztesy, Rickes, and Stokes[121] isolated a pure substance which is effective for *S. lactis* but is inactive for *L. casei* and they suggest that it is not folic acid. Pfiffner, et al.[122] have obtained from liver a compound in pure form which is active in preventing anemia[123] in chicks on purified diets. These workers have retained the term B_c for this compound and they suggest that it may be identical with both the *L. casei* and *S. lactis* factors. In light of the above report this is not possible. The question which remains therefore is: are the two bacterial growth factors related to the factors needed by the rat, chick and monkey? Briggs, et al.[124] have clearly demonstrated that the chick requires two factors which are separate and distinct from the *S. lactis* factor. These two factors have been temporarily called vitamins B_{10} and B_{11}. It is more likely that the factor needed by rats fed the sulfonamides and by monkeys fed synthetic diets is related to the *L. casei* factor, especially since the factor corrects an anemia in chicks. The final isolation of these factors will do much to give us a complete picture of the remaining B vitamins.

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BOOKS AND REPORTS

All reviews are prepared on invitation. Unsolicited reviews cannot be accepted.

Medicine and the War—*Edited by William H. Taliaferro. Chicago: University of Chicago Press,* 1943. 193 pp. Price, $2.00.

This admirable series of ten popular lectures was delivered in the spring of 1943 by members of the faculty of the Division of the Biological Sciences of the University of Chicago under the sponsorship of the Charles R. Walgreen Foundation for the Study of American Institutions. The historical introduction to war medicine is by Dr. Arno B. Luckhardt, Professor of Physiology. The subjects of Food, Chemotherapy, Malaria, Insects, Shock and Blood Substitutes, Aviation Medicine, Brain Injuries, Psychiatric Disorders, and Chemical Warfare are covered by Professors Paul R. Cannon, E. M. K. Geiling, William H. Taliaferro, Clay G. Huff, Alexander Brunschweig, Henry T. Rickets, A. Earl Walker, David Slight and Franklin C. McLean. The essays are intended to promote a wider dissemination among the general public and the medical profession of basic information concerning recent advances in war medicine. They cover the subjects briefly, although authoritatively, and can be recommended to public health workers who are not experts in these fields of medicine.

GEORGE BAEHR

The Organization of Permanent Nation-wide Anti-Aedes aegypti Measures in Brazil—*By F. L. Soper, D. B. Wilson, S. Lima, and W. Sá Antunes. New York: Rockefeller Foundation,* 1943. 137 pp.

This monograph is a highly detailed account of the organization instituted by the Brazilian Government and the Rockefeller Foundation for the control of the *Aedes aegypti* mosquito in Brazil, stressing the particular problems encountered both in rural and urban areas, and those peculiar to this species of mosquito. It would seem very desirable that the southern states here and the other South American republics should follow this leadership and adopt similar measures.

The most significant fact revealed is the remarkable results obtained by the authors. For example, the incidence of houses with aedes in Natal was reduced from 10 per cent in 1931 to zero in 1934. This, of course, will result in lowered yellow fever and dengue fever rates.

The organization of the text could have been planned better. In the body of the work too many forms for inspectors, diagrams of flags, etc., are included. These could have been placed to more advantage in an appendix along with the intricate details of filling them out. The duties and responsibilities of the personnel are fully explained, but the sequence of this material is broken by the forms.

Only one fault of omission can be readily found, namely, that there is nowhere any reference made as to the training of the inspectors who are the backbone of the organization.

The problems of mosquito control and eradication are most vital at the present time, therefore this book should prove of great value to public health officials who are responsible for this type of work. WILSON G. SMILLIE

Fundamentals of Personal Hygiene—*By Walter W. Krueger. (4th ed.) Philadelphia: Saunders,* 1944. 315 pp., ill. Price, $1.75.

The preface to the fourth edition of

this book states that the aim of the book is to "motivate the student to formulate a rational health program and thus to acquire the art of living healthfully." How far health teaching and reading books can help in such motivation, the reviewer does not know.

This book was definitely not written with the viewpoint of the youngster in mind. It neglects the natural self-interest of growing up and getting something out of life. It "tells" more than it teaches. The factual material presented is quite detailed regarding physical fitness. Very little can be learned about vision and hearing. The same is true regarding items on community health.

The chapters on the mouth, the skin, the feet, and especially health fads, fancies, and follies are adequately covered. There are two excellent chapters on "Health of the Mind," and one on "Hygienic Aspects of Sex," but what a title.

There are at least two serious mistakes, both in the chapter on "Sunlight and Health." Ultra-violet rays are described as a factor in preventing tooth decay and, an even more dangerous statement, "It is now believed by some investigators that sunlight may prevent death from cancer." Since when do investigators merely "believe"? They should *know*. Theories on prevention and cure should be omitted.

It is beyond our understanding why in the list of "Topics for Oral or Written Discussion" included in the chapter on "Health of the Mind," was the question, "Would a fifth freedom; namely, the freedom of individual enterprise, be of value for mental health *as well as for other reasons?*" (Italics ours.)

Illustrations are supposed to help the reader to understand the text. Unfortunately, most of the illustrations are meaningless, inadequate, and poorly labeled. There are very few original drawings or photographs. Most of the pictorial material is second hand and from commercial sources.

The bibliography is excellent and the book can be recommended for use by teachers but, in the interest of the mental hygiene of students, we hope it is not scheduled as required reading.

BRUNO GEBHARD

Maurice Arthus' Philosophy of Scientific Investigation: *Preface to De l'Anaphylaxie a l'Immunite, Paris, 1921. Translated from the French, with an Introduction by Henry E. Sigerist. Foreword by Warfield T. Longcope. Baltimore: Johns Hopkins Press,* 1943. 26 pp. Price, $.75.

Here in only seventeen pages is epitomized the full spirit of research. It is a translation of the preface of Arthus' famous *De l'Anaphylaxie a l'Immunite.* We owe a real debt of gratitude to Dr. W. T. Longcope, Professor of Medicine, and to Dr. Henry E. Sigerist, Professor of the History of Medicine at Johns Hopkins, for recognizing the scientific and literary value of this gem. Their ardent sponsorship and Sigerist's colorful translation provide its very appropriate setting.

With deft precision Arthus outlines the principles of all experimental methods: "Observe facts, conceive a hypothesis, determine its value through . . . experiments . . . give the interpretation . . . and ascertain the excellence of this interpretation through strict criticism; generalize the results experimentally. . . ." He gives a stern rebuke to those who follow the primrose path: "Seek facts and classify them . . . and you will be the workmen of science. Conceive or accept theories . . . and you will be their politicians."

The paper is not written negatively. Arthus shows that pitfalls are to be avoided by honesty, clarity, precision, and self criticism. The final exhorta-

tion to independence and originality is downright evangelical.

This is a perfect gift to the young person who contemplates or has entered upon a scientific career. Arthus does not emanate the glamor of the pseudo-scientist but in this booklet provides an eternal inspiration and beacon. Sigerist most aptly describes Arthus's service to the neophyte scientist: "His honesty, his fanatical devotion to science, his insistence on originality and last but not least his method, still the most promising one today, will provide them with guidance and will renew their faith in the dark hours of discouragement through which every researcher must go."

This attractive presentation by the Johns Hopkins Press is also sturdy. It is a booklet to be cherished and preserved.

CHARLES EDWARD SMITH

Understanding Juvenile Delinquency—*Children's Bureau Publication 300.* 52 pp. Price, $.10.

Controlling Juvenile Delinquency—*Children's Bureau Publication 301.* 28 pp. Price, $.10. *Washington: U. S. Department of Labor, Children's Bureau,* 1943.

These helpful pamphlets complete a series of three issued by the U. S. Children's Bureau on the recommendation of the Children's Bureau Commission on Children in Wartime. As the war has progressed the problem of juvenile delinquency has become more and more acute. Communities throughout the country have been attempting to control juvenile delinquency with very little success in the present emergency. It is first necessary to have clearly in mind what juvenile delinquency really is, and the factors which contribute to it. These pamphlets meet both of these demands.

It is pointed out that "In wartime, as in peacetime, juvenile delinquency results from our failure to satisfy the basic needs of children and youth—the need for security and for opportunity for growth and development."

The factors contributing to delinquency are well set forth in this series and the community resources which may be tapped are emphasized in the section on Prevention and Treatment. The pamphlets are practical rather than theoretical and deserve wide circulation at this critical time.

RICHARD A. BOLT

Health and Hygiene—*By Lloyd Ackerman. Lancaster, Pa.: Jaques Cattell Press,* 1943. 895 pp. Price, $5.00.

The author has attempted to provide a book that appeals to mature minds in all walks of life. He believes that institutions of higher learning err in offering hygiene to freshmen, in that they are unprepared to understand the problems of health and disease and to grasp the possibilities of obtaining and maintaining health.

The field of personal health is well covered, except that in the industries. Unusual emphasis is given to the rôle of the mental and emotional aspects of health. In fact, the reader is likely to come to the conclusion that these are the major factors in obtaining and maintaining health.

After introductory chapters on the hygienic concept and the causative agents in health, disease, and death, the author treats of the evolution of health concepts and practices, and evaluates these. Next follow chapters on parasitism and hypersensitiveness, nutrition, emotions and the intellect, and the hygiene of the sexual life. Lastly he treats of the exogenous poisons and physical agents in their relation to health.

The author is to be commended for presenting clearly both sides of controversial questions. The frequent use of

technical terms that are not familiar to the general reader leads to the suggestion that a glossary be added to this excellent treatise.

The chapter on the evaluation of health procedures should be read widely by those who are skeptical of the methods of science.

EDWARD C. SCHNEIDER

Allergy Anaphylaxis and Immunotherapy—*Basic Principles and Practice—By Bret Ratner. Baltimore: Williams & Wilkins,* 1943. 834 pp. Price, $8.50.

The book is described in the subtitle, "A treatise presenting the fundamental principles and practice governing the use of antisera, vaccines, toxoids, blood transfusions, blood substitutes and sulfonamides, in the prevention and treatment of infectious diseases and of the allergic phenomena resulting from their use."

In Book I, the practitioner, who makes use of these prophylactic and therapeutic agents will find lucid and informative discussions of their nature, source, methods of preparation and of administration, in forty-odd infections. This part of the book should be a useful supplement to the chapters on infectious diseases in the textbooks of medicine and of the pediatrics.

Book II contains an excellent comprehensive, thoughtful, and practical discussion of serum allergy in all its phases. Drug allergy and transfusion reactions are covered briefly but adequately. There are few physicians, allergists excepted, who will not find this portion of the book illuminating and useful.

There is little in Book III which is not found in the recent textbooks of allergy.

On the whole, the book is worth while. It is well planned and well presented. A few minor criticisms are in order, however. The studies of Cooke, Loveless, Hampton, Sherman, *et al.,* of the thermostable or blocking antibody should certainly have been discussed. The studies of Karelitz and Glorig on serum sickness may have appeared too late (August, 1942), for inclusion. The author's arteriolar spasm theory of wheal formation has been discredited. Book III has more academic than practical interest. None of these detract significantly from the value of the book. OSCAR SWINEFORD, JR.

Ohio River Pollution Survey—*Final Report to the Ohio River Committee. Federal Security Agency, U. S. Public Health Service, Cincinnati, Ohio,* 1942. 793 pp.

The final report of the U. S. Public Health Service has just been made to the Ohio River Committee. This committee was appointed by the Secretary of War under authority granted by the River and Harbor Act of August 26, 1937, to supervise a study of Pollution in the Ohio River Basin. The committee consisted of a representative of the Corps of Engineers, United States Army, Brigadier General T. M. Robins (first representative was Brigadier General Max C. Tyler); a member of the United States Public Health Service, R. E. Tarbett; and a non-government expert, Dr. Abel Wolman. The survey was designed to ascertain what pollution substances are being deposited, directly or indirectly, and the sources and extent of such deposits, with a view to determining the most feasible method of correcting and eliminating the pollution.

In the Public Health Service report to the committee, separate statements are made on the findings for the main Ohio River, the minor tributary basins, and on 19 major tributary basins. The report includes 6 supplements, outlining in some detail the following phases of the study: Collection of Data on Sources of Pollution, Laboratory, Or-

ganization and Methods, Acid Mine Drainage, Industrial Waste Guides, Epidemiological Studies, Biological Studies.

The report is especially significant because it is the first pollution study of a complete large river basin (including all of its tributaries) in the United States, covering some 204,000 square miles. A technical staff of 95 engineers, chemists, and bacteriologists, together with personnel from the various state health departments and the Tennessee Valley Authority, spent over 4 years in the collection and analyses of the data. These studies are valuable not only because of the completeness of the data collected on the Ohio River Basin, but because the technics used will serve for many years as a guide for similar and comparable studies of other river basins. The Corps of Engineers has also made its report to the committee and a joint report with recommendations and cost estimates for comprehensive control measures has been made by the committee to Congress as instructed in the Act. The complete report will be available later in printed form.

ALFRED H. FLETCHER

Health for the Having—*A Handbook for Physical Fitness—By William R. P. Emerson, M.D. New York: Macmillan,* 1944. 146 pp. Price, $1.75.

The author dedicated this pocket size book of 146 pages "to the thousands of our youth whose greatest disappointment has been their rejection for active duty in all branches of our armed forces because of physical unfitness." Since our future existence depends upon man power, Dr. Emerson emphasizes the necessity of improving physical and mental stamina. In 15 chapters he offers advice on how this can be done.

The physician can correct physical defects, but the individual only can correct faulty health habits. He states that "after middle life our chances of reaching old age are no greater than 50 or 100 years ago." Therefore he explains what steps are necessary for individuals to take in order to prevent crippling degenerative diseases and also to attain and maintain high buoyant health.

Discussion centers on such subjects as physical fitness examination, weight, blood pressure, health habits, starving amidst plenty, overwork, time budgeting, the American school system and health, and longevity—14 pages in the appendix give tables of various kinds. This is a book for lay adults. It touches briefly on many health subjects of common interest.

W. W. PETER

Physical Fitness for Boys—*By Ben Miller, Karl W. Bookwalter, and George E. Schlafer. New York: Barnes,* 1943. 457 pp. Price, $3.00.

Physical fitness teachers and supervisors are provided with a useful directing instrument in this book. Provision for details of planning and evaluation of programs and of student progress are well indicated. Emphasis is placed on need for continuity of physical fitness programs in student development. Activities from which selection may be made for adequate programs under differing circumstances are offered. Details of administration, including a realistic proposal of record forms, represent a contribution.

General legal and moral responsibilities of the school in physical fitness are brought forward, for instance, in school accidents. Suggestions for qualifications of staff, improvement of staff, maintenance of morale, evaluation of instruction, and program promotion should be found useful.

While basic individual health is mentioned as a requisite in these programs, the text does not cover methods of securing the coöperation of public health,

medical, dental, nursing, and other health groups. Health evaluation of individuals and groups as a concomitant of physical fitness is not provided. Disease prevention and health education in the program are inadequately treated. Provisions for handling those physically inadequate are not detailed. More adequate treatment of problems, such as fatigue and nutrition, in relation to physical efficiency, might well have been expected. Methodology and plans for coördination of school programs with community and industrial recreation organizations might have been included.

F. M. HEMPHILL

A Guide to Practical Nutrition—*Edited by Michael G. Wohl, M.D., and John H. Willard, M.D. Sponsored by the Committee on Nutrition and Deficiency Diseases of the Philadelphia County Medical Society, Philadelphia, Pa.*, 1943. 98 pp. Distributed to physicians.

The Committee on Nutrition and Deficiency Diseases of the Philadelphia County Medical Society has prepared for the medical profession a convincingly written 98 page book which is not just another recital of nutrition fundamentals. The points covered show the result of careful discrimination whereby only facts which apply directly to the everyday medical problems are included, with special emphasis on those subclinical conditions which are now recognized to be just as important as a definite pathological deficiency disorder.

Throughout the text is an appeal to every physician to use this newer knowledge of nutrition to educate the public to appreciate the importance of proper nutrition as a means of promoting the physical improvement of the individual for the welfare of America. "*A Guide to Practical Nutrition* is to be considered part of a program of public health education—not as a complete coverage of the field of nutrition."

Dr. Morris Fishbein says in the Introduction: "Until adequate knowledge of deficiency diseases and scientific nutrition becomes the property of all members of the medical profession, the utmost that can be accomplished in this field will not be accomplished."

The book consists of 13 papers written by 12 different people, all but two of whom are physicians. One of these physicians who wrote the section on Nutritional Aspects of Dental Disease also is a dentist. Although the subject is addressed to the physician, the book will be of value to nurses, nutritionists, teachers of home economics, and others who have the background to enable them to interpret its scientific terms.

LUCY H. GILLETT

Expectantly Yours—*A Book for Expectant Mothers and Prospective Fathers—By Mario A. Castallo, M.D., and Audrey Walz. New York: Macmillan*, 1943. 110 pp. Price, $1.75.

Among many books for expectant mothers and fathers, *Expectantly Yours* is unique in two ways: it gives more background, setting, and general orientation to maternity than is usual in such small space, and it is written definitely for the well-read, sensitive patient who can profit by information on a higher level of knowledge than is usually offered. The authors use such phrases as "chemical affinity," "salivation," "involution," and touch on such topics as sex determination, syphilis and gonorrhea, forceps delivery, and caudal anesthesia.

Withal, this work is practical, scientifically sound and direct, and it is so entertainingly written that it will not be put down.

DOROTHY DEMING

A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

RAYMOND S. PATTERSON, PH.D.

Sour Public Health Note—In 1943, Mr. and Mrs. United States and most of the little U. S.'ers smoked 257 billion (note the "b" please) cigarettes. The additional billions sent tax free to our soldiers are not counted. *Per capita* the annual figure is 1,877, and each year it increases hugely. Please complete your own annotation.

ANON. Tobacco Consumption in the United States. J.A.M.A. 125, 3:213 (May 20), 1944.

Germicidal Mists—Maintenance of glycol vapors in adequate concentration is possible in large spaces, but some means of air agitation is desirable, and a minimum relative humidity of 40 per cent is necessary.

BIGG, E., *et al.* The Use of Glycol Vapors for Bacterial Control in Large Spaces. Am. J. M. Sc. 207, 3:361 (Mar.), 1944.

Hospitals, Health Departments and Health—If health facilities—preventive and curative—are to be distributed equitably, there is need, in each country, for a national health service with a central, or federal, agency responsible for all aspects of national hygiene. How hospitals might fit into this scheme is the nub of this paper. Though the arguments are persuasive, there will be some who will agree only that there should be a national health service in every country—except the U.S.A.

DRAPER, W. F. Hospitals in the Public Health Panorama. Pub. Health Rep. 59, 16:513 (Apr. 21), 1944.

Pudding's Proof—In Iceland there is an epidemic of whooping cough about every 7 years. Almost every susceptible child catches it, then the conflagration dies out for lack of fuel. In the face of the latest visitation 5,000 Reykjavik children were quickly vaccinated. Percentage-wise this is what happened: compared to controls nearly 6 times as many of the protected children escaped altogether; in each group half the children had mild infections (no whoop); mediumly severe infections were twice as common among the controls; and gravely severe infections more than double.

DUNGAL, N., *et al.* Vaccination Against Whooping Cough. J.A.M.A. 125, 3:200 (May 20), 1944.

Gonorrhea Should Go—Another note reminding us that penicillin really does cure gonorrhea—if given in sufficient dosage. This is good news for the v.d. controllers, for the drug is now to be available for civilian use too, apparently.

FERGUSON, C., and BUCHHOLTZ, M. Penicillin Therapy of Gonorrhea in Men. J.A.M.A. 125, 1:22 (May 6), 1944.

Department of Stray Facts—Miscellaneous information to add to your little store of knowledge: When rabbits are injected with diphtheric toxoid incorporated in lanolin, antitoxin formation is enhanced and prolonged, as compared with plain toxoid. Paraffin oil enhances antibody formation against typhoid bacilli and killed tubercle bacilli have an additional synergistic effect. There isn't much you can do with this intelligence at the moment.

FREUND, J., and BONANTO, M. V. The Effect of Paraffin Ail, Lanolin-like Substances and Killed Tubercle Bacilli on Immunization with Diphtheric Toxoid and *Bact. Typhosum.* J. Immunol. 48, 5:325 (May), 1944.

More Evidence That Generalized Nursing Is Practical—For twenty years Berkeley (Calif.) has carried on a unified, generalized nursing program. This report tells about the school, public health, and visiting nursing services which each of the staff members performs. The plan is fundamentally sound and provides the community with the most efficient service at the lowest possible cost, concludes the writer.

GILCREST, E. W. A Unified Service of Long Standing. Pub. Health Nurs. 36, 4:164 (Apr.), 1944.

Alcoholism as a Public Health Problem—Part one gives promise that this series will be unusually interesting and provocative. It is a dissertation on present-day scientific research in the field of alcohol studies, the outgrowth of a good deal of pseudo-science undertaken to prove the wishful beliefs of pros or antis. What I like about the paper is its tone—it is written with a reasonableness that is most reassuring.

JELLINEK, E. M. Alcohol Research—Theoretical and Practical. Pub. Health Nurs. 36, 5:223 (May), 1944.

Uses of Cancer Reports—Is the cancer reporting game worth the statistical candle in respect to the light it sheds? The arguments against reporting are well known and are frequently aired. There seems to be a good case for reporting in this account of three years' experience in New York State.

LEVIN, M. P. Cancer Reporting in New York State. New York J. Med. 44, 8:880 (Apr. 15), 1944.

"Better Health for the People"—What sort of black magic, do you suppose, boils up through that wholly imaginary line marking the Canadian-American border which permits the reasonable men on the north side, who govern the affairs of the Canadian medical association, to think and talk about public medical services with equanimity, while equally reasonable men south of the line, who decide the affairs of our medical association, see red whenever the word social medicine is mentioned? The paper prompting this impertinent speculation is about integrated health and medical services in Canada.

LEWIS, D. S., and JACKSON, F. W. The Integration of Preventive and Curative Medicine in Health Insurance. Canad. Pub. Health J. 35, 3:99 (Mar.), 1944.

Healthy Skepticism about Nutrition—A Doubting Thomas *sp. Canadensis* looks critically at the spurious accuracy which seems to be the basis for a good many of the nutritional standards set up by certain Canadian authorities. Where, he asks, are the data to support the recommendation that a man must have 75 mg. of ascorbic acid, but a woman only 70 mg.? That is only a single sample. One wonders if our straight-faced, American pronouncements have been scrutinized with equal objectivity.

MCHENRY, E. W. Recent Trends in Nutrition. Canad. Pub. Health J. 35, 4:154 (Apr.), 1944.

About a Neglected Step-child—Time was when the educational movie enjoyed a prominent place in the affections of us sanitarians. With certain notable exceptions among our health agencies, it is safe to assume that health movies are being neglected today, yet American military authorities and Canadian and British civil authorities are making increasing use of training and documentary films. This paper suggests what may be wrong with our unsatisfactory health "squeakies."

NICHTENHAUSER, A. Planned Health Film Production. J. Health & Phys. Educ. 15, 5:251 (May), 1944.

Tomorrow's Defenses against Disease—Pointing out the interdependence of military and civilian public

hygiene and the steps being taken to secure a healthy citizenry in support of a healthy soldiery, the Surgeon General suggests that the future of medicine may be in the hands of the thousands of physicians now in the military and naval services. Concentrated there are the youngsters who have the greatest stake in that future. Having become used to the best facilities of modern group medicine they may be loath to return to a " horse and buggy " medical economy.

PARRAN, T. Teamwork on the Health Front. Mil. Surgeon. 94, 2:76 (Feb.), 1944.

Antidote for Rose-colored Spectacles—We have started toward the greatest epidemic of gonorrhea that our country has ever experienced, says this man who sees all sides of this problem and warns against the easy assumption of cure after a brief course of sulfonamides.

PELOUZE, P. S. Gonorrhea: The Epidemic We Face. Ven. Dis. Inform. 25, 3:76 (Mar.), 1944.

Enormous in Scope and Complex in Character—Eleven papers presenting up-to-the-minute solutions for problems in industrial health. Tuberculosis, factory sanitation, nutrition, eyesight conservation, rehabilitation, and vocational training are some of the timely topics discussed in this symposium, which every interested health worker quite naturally will read.

SELGER, S. J., *et al.* Sixth Annual Congress on Industrial Health. J.A.M.A. 125, 4:239 (May 27), 1944.

Without Benefit of Kenny—So much has been written about the superiorities of the Kenny treatment, that there will be interest in the outcome of some recent Chicago cases in which orthodox methods were employed. Roughly, three-quarters of the patients had no, or barely detectible, residual weakness at the end of care.

SHERMAN, M. S. The Natural Course of Poliomyelitis. J.A.M.A. 125, 2:99 (May 13), 1944.

Worms, *et al.*—From the parasite-infested corners of the earth our military personnel will return with a cumulative load of tropical diseases unequalled since the days of slave-trading, cheerfully prophesies this writer. What to do about protozoal diseases, and nematode, cestode, and trematode infestations is the timely burden of this paper.

WRIGHT, W. H. Present and Post-War Health Problems in Connection with Parasites. Science. 99, 2568:207 (Mar. 17), 1944.

BOOKS RECEIVED

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VITAL STATISTICS OF THE UNITED STATES, 1941. U. S. Department of Commerce, Bureau of the Census. Washington: Government Printing Office, 1943. Part I, 244 pp. Price, $1.25. Part II, 564 pp. Price, $2.00.

POPULATION TRENDS IN ALLEGHENY COUNTY. Pittsburgh: Bureau of Social Research, Federation of Social Agencies of Pittsburgh and Allegheny County, 1944. 48 pp. Price, $.50.

THE MANAGEMENT OF NEUROSYPHILIS. By Bernard Dattner. New York: Grune & Stratton, 1944. 398 pp. Price, $5.50.

RADIATION AND CLIMATIC THERAPY. Edited by Edgar Mayer. Baltimore: Williams & Wilkins, 1944. 393 pp. Price, $5.00.

TUBERCULOSIS OF THE EAR, NOSE AND THROAT. By Mervin C. Myerson. Springfield, Ill.: Thomas, 1944. 291 pp. Price, $5.50.

THE VOLUNTARY HOSPITAL TODAY AND TOMORROW. Report of the second wartime symposium arranged by the United Hospital Fund of New York in coöperation with the Greater New York Hospital Association and the New York Academy of Medicine. New York: United Hospital Fund of New York, 1944. 46 pp. (Free from publisher.)

NOTES ON NURSING BY A NURSE. By Sarah Corry. Illus. New York: Appleton-Century, 1944. 160 pp. Price, $1.50.

CLINICAL EVALUATION OF THE REHABILITATION OF THE TUBERCULOUS. By Louis E. Siltzbach. New York: National Tuberculosis Association, 1944. 70 pp. Price, cloth-bound, $1.00. Paper-bound, $.50.

FUNDAMENTALS OF PSYCHIATRY. By Edward A. Strecker. 2nd ed. Philadelphia: Lippincott, 1944. 219 pp. Price, $3.00.

ONE HUNDRED YEARS OF AMERICAN PSYCHIATRY. By the American Psychiatric Association. New York: Columbia University Press, 1944. 649 pp. Price, $6.00.

HEALTH AND HUMAN WELFARE. By William E. Burkard, Raymond L. Chambers and Frederick W. Maroney. New York: Lyons & Carnahan, 1944. 640 pp. Price, $1.35.

INVITATION TO HEALTH. By Harry J. Johnson. New York: Prentice-Hall, 1944. 249 pp. Price, $2.75.

FREEDOM FROM FEAR. By Louis H. Pink. New York: Harper, 1944. 254 pp. Price, $2.50.

VOLUNTARY MEDICAL INSURANCE IN THE UNITED STATES: MAJOR TRENDS AND CURRENT PROBLEMS. By Helen Hershfield Avnet. New York: Medical Administration Service, 1944. 104 pp. Price, $1.00.

MANUAL OF HUMAN PROTOZOA. By Richard R. Kudo. Springfield, Ill.: Thomas, 1944. 125 pp. Price, $2.00.

YEARBOOK OF GENERAL THERAPEUTICS, 1943. Edited by Oscar W. Bethea. Chicago: The Year Book Publishers, 1944. 480 pp. Price, $3.00.

ATLAS OF HUMAN ANATOMY. By Franz Frohse, Max Brodel, and Leon Schlossberg. New York: Barnes & Noble, 1944. 86 pp. Price, cloth-bound, $2.25. Paper-bound, $1.50.

ANNUAL REVIEW OF PHYSIOLOGY. By American Physiological Society and Annual Reviews. (Vol. VI.) Stanford, Calif.: Annual Reviews, 1944. 630 pp. Price, $5.00.

ANALYTICAL CHEMISTRY OF INDUSTRIAL POISONS, HAZARDS AND SOLVENTS. By M. B. Jacobs. (Vol. I, 2nd ed.) New York: Interscience Publishers, 1944. 661 pp. Price, $7.00.

WARTIME HEALTH AND EDUCATION. Hearings before a Subcommittee of the Committee on Education and Labor, United States Senate. (Part II.) Washington: U. S. Government Printing Office, 1944. Pp. 601–1048, incl.

THE FORTY-THIRD YEARBOOK OF THE NATIONAL SOCIETY FOR THE STUDY OF EDUCATION. Prepared by the Society's Committee. Part I. Chicago: Department of Education, the University of Chicago, 1944. 354 pp. Price, $2.25.

THE BABY MANUAL. By Herman N. Bundesen. New York: Simon and Schuster, 1944. 590 pp. Price, $3.00.

HEALTH FOR YOUNG AMERICANS. By William E. Burkard, Raymond L. Chambers, and Frederick W. Maroney. Illus. New York: Lyons & Carnahan, 1943. 375 pp. Price, $.75.

THREE FRIENDS. By Elizabeth Montgomery and Dorothy Baruch. Illus. New York: Scott, Foresman, 1944. 160 pp. Price, $.84.

ASSOCIATION NEWS

SECOND WARTIME PUBLIC HEALTH CONFERENCE AND SEVENTY-THIRD ANNUAL BUSINESS MEETING AMERICAN PUBLIC HEALTH ASSOCIATION

New York, N. Y., October 3–5, 1944
Headquarters: Hotel Pennsylvania

RATES QUOTED BY NEW YORK HOTELS

Second Wartime Public Health Conference and Seventy-third Annual Business Meeting—October 3–5, 1944

	Rooms Without Bath		*Rooms With Bath*	
	Single	*Double*	*Single*	*Double*
Headquarters:				
Pennsylvania, 7th Ave. & 33rd St.			$3.85– 6.60	$5.50– 8.80
Hotels near Hotel Pennsylvania:				
Governor Clinton, 7th Ave. & 31st St.			3.30– 5.50	4.40– 7.70
Martinique, Broadway & 32nd St.	$2.00–2.50	$3.00–4.00	2.75– 3.85	3.85– 5.95
McAlpin, Broadway & 34th St.	2.20–2.75	3.85–4.40	3.30– 6.60	4.95– 8.80
New Yorker, 8th Ave. & 34th St.			3.85– 8.80	5.50–11.00
Allerton House, 143 East 39th St.	2.00–2.25		2.75– 3.00	
Allerton House for Women, 130 East 57th St.	2.00–2.50		3.00– 3.50	
Ambassador, Park Ave. & 51st St.			6.00– 8.00	$8.00–10.00
Astor, Broadway & 44th St.			3.50– 5.00	6.00– 8.00
Barbizon (Women), Lexington Ave. & 63rd St.	2.00–2.75	3.50–4.50	3.25– 3.75	4.50– 5.50
Barclay, 111 East 48th St.			6.00– 7.00	8.00–10.00
Belmont Plaza, Lexington Ave. & 49th St.			4.00– 5.50	6.00– 8.00
Beverly, Lexington Ave. & 50th St.			5.00– 6.00	7.00– 8.00
Biltmore, Madison Ave. & 43rd St.			5.50–12.00	7.50–14.00
Bristol, 129 West 48th St.	1.75–2.00	3.00	2.50– 4.00	3.50– 6.00
Capitol, 8th Ave. & 51st St.	2.50		3.50– 4.00	5.00– 6.00
Carlyle, Madison Ave. & 76th St.			6.00– 7.00	8.00– 9.00
Chesterfield, 130 West 49th St.	1.50–2.00	2.50–3.00	2.50– 3.00	4.00– 6.00
Commodore, Lexington Ave. & 42nd St.			3.50– 5.50	5.50– 8.80
Concourse Plaza, Grand Concourse & 161st St.			3.50– 4.50	5.50– 6.50
Cornish Arms, 311 West 23rd St.			2.25– 3.00	4.00– 4.25
Essex House, 160 Central Park South			6.00– 8.00	8.00–10.00
Fifth Avenue Hotel, 24 Fifth Ave. (9th St.)			5.00– 6.00	7.00– 8.00
Henry Hudson, 353 West 57th St.			2.50– 3.00	3.50– 5.00
Kenmore Hall, 145 East 23rd St.	1.50–2.00	2.50–3.00	2.00– 3.50	3.50– 5.00
Lexington, 48th St. & Lexington Ave.			4.00– 6.00	6.00– 8.00
Luxor Baths Hotel, 121 West 46th St.			2.25– 2.75	4.50– 5.50
Midston House, 22 East 38th St.	2.25–2.50		3.50	4.00– 4.50
New Weston, Madison Avenue & 50th St.			4.00– 6.00	6.00– 9.00
Paramount, 46th St. West of Broadway			3.00– 4.50	4.00– 8.00
Park Central, 7th Ave. & 55th St.			4.00– 5.00	6.00– 8.00
Parkside, 18 Gramercy Park South	2.25		2.75– 3.30	5.00– 6.00
Piccadilly, 227 West 45th St.			3.00– 4.00	4.50– 6.00
Plymouth, 143 West 49th St.			2.50– 3.50	4.00– 5.00
President, 234 West 48th St.			2.50– 4.00	4.00– 5.00
Prince George, 14 East 28th St.			2.50– 4.00	4.00– 7.00
Roosevelt, Madison Ave. & 45th St.			4.50– 8.00	6.50–12.00
Shelton, 49th St. & Lexington Ave.	2.50		3.50– 5.00	5.00– 7.00
Taft, 7th Avenue & 50th St.	2.00–2.50	3.50–4.00	2.50– 5.00	3.50– 8.00
Times Square, 43rd St. & 8th Ave.	2.00–2.50	3.00–3.50	2.25– 3.00	4.00– 5.00
Tudor, 304 East 42nd St.			2.50– 4.00	4.00– 6.00
Victoria, 7th Ave. & 51st St.			3.00– 4.00	4.50– 7.00
Waldorf-Astoria, 50th St. & Park Ave.			7.00–10.00	10.00–12.00
Warwick, 54th St. & 6th Ave.			5.00– 6.00	7.00– 8.00
Wellington, 7th Ave. & 55th St.			3.00– 5.00	4.00– 7.00
Woodstock, 127 West 43rd St.	2.00–2.50	3.50–4.00	3.00– 5.00	4.00– 7.00

APPLICANTS FOR MEMBERSHIP

The following individuals have applied for membership in the Association. They have requested affiliation with the sections indicated.

Health Officers Section

Charles F. Atkinson, M.D., Court House, Traverse City, Mich., Director, Grand Traverse-Leelanau Health Dept.

Douglas B. Avison, M.D., D.P.H., 293 Ethel St., Kelowna, B. C., Canada, Director, Okanagan Valley Health Unit

Benjamin W. Black, M.D., 2701 14th Ave., Oakland 6, Calif., Alameda County Medical Director

Alvin R. Christopherson, D.M.D., 805 Tribune Bldg., Salt Lake City, Utah, Member, State Board of Health

William D. Cutsungavich, M.D., Holden, Alta., Canada, Medical Officer of Health, Holden Health Unit

Abe J. Davis, M.D., Richmond County Health Dept., Augusta, Ga., Commissioner of Health

George M. Downard, Ph.C., 315 U. S. Custom House, Portland 9, Ore., Inspector, U. S. Food and Drug Administration

John R. Francella, M.D., 227 E. Chestnut St., Coatesville, Pa., Health Officer

Dudley Glen-Campbell, M.B., D.P.H., Tuberculosis Clinic, Kingston, Jamaica, B.W.I., Asst. Tuberculosis Officer, Jamaica Government

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Carl E. Hill, M.D., 5248 Yonge St., Willowdale, Ont., Canada, Medical Officer of Health, Township of North York

Bernard Hochfelder, M.D., 809 Pere Marquette Bldg., New Orleans 12, La., Physician

John B. Hozier, M.D., M.P.H., 8 Kilsyth Terrace, Brookline, Mass., Surgeon, U. S. Public Health Service; Director, Genito-Infectious Division, Massachusetts Dept. of Public Health

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Harold M. Johnston, M.B., M.P.H., Island Medical Office, Kingston, Jamaica, B.W.I., Malaria Officer, Government of Jamaica

Herbert S. Lawrence, D.P.H., Port Maria, Jamaica, B.W.I., Health Officer, St. Mary Government Medical Service

Hyacinth Lightbourne, M.B., D.P.H., 187 Mountain View Ave., Liguanea, Jamaica, B.W.I., Medical Officer of Health, Jamaica Medical Service

John A. Lindquist, M.D., 300 S. 7th St., City Hall, Springfield, Ill., Director of Health

Albert F. Litzenburger, M.D., 411 Pearl St., Boyne City, Mich., Director, Dist. No. 3, Michigan Dept. of Health

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Alfred A. Peat, M.B., M.P.H., Spanish Town, Jamaica, B.W.I., Medical Officer of Health, Jamaica Government

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Tennyson B. Sinclair, M.D., D.P.H., Port Antonio, Jamaica, B.W.I., Health Officer, Island Medical Dept.

Edward J. Valentine, M.B., D.P.H., Falmouth, Jamaica, B.W.I., Medical Officer of Health, Jamaica Government Medical Service

H. Garner Wright, M.D., County Court House, Bellingham, Wash., Health Officer, Whatcom County Health Dept.

Otis W. Yeager, M.D., 14th Ave. and Lake St., San Francisco, Calif., Medical Officer, Plague Suppressive Measures, U. S. Public Health Service

Laboratory Section

Josephine Alsworth, 440 Winton St., Jackson, Miss., Bacteriologist, State Board of Health

Leonard E. Arnold, M.D., D.P.H., 4 Ripon Road, Cross Roads, Jamaica, B.W.I., Asst. Government Pathologist and Bacteriologist, Government of Jamaica

Lenora J. Burditt, 5911 Grand Ave., Riverside, Calif., Student, University of California

Major Harry E. Carnes, M.C., Exec. Officer, U. S. Army Medical Laboratory

Virgil F. Chapman, Health Dept., City Hall, Dubuque, Iowa, Sanitary Bacteriologist

William E. Clapper, Ph.D., University of Utah, Salt Lake City, Utah, Asst. Professor of Bacteriology

Anne Craig, 1339 North State, Jackson, Miss., Medical Technician, State Board of Health

Cornelia E. Dingle, 306 Riverway, Boston 15, Mass., Bacteriologist, State Health Dept.

Richard Eglinton, 1179 Main St., Hartford

1, Conn., Chief Microbiologist, Bureau of Laboratories, State Dept. of Health

Kelly H. Eldredge, 1862 Lake St., Salt Lake City, Utah, Teacher of Bacteriology, University of Utah

June F. Gaffney, 1865 Clay St., San Francisco 9, Calif., Laboratory Technician, Southern Pacific General Hosp.

Lt. Milton Goldin, Sn.C., Laboratory Officer, U. S. Army Hospital

Martha K. Hohl, 1834 Delaware St., Berkeley 3, Calif., Bacteriologist, Div. of Labs., State Dept. of Health

Kathleen Hussey, Ph.D., 600 W. 168th St., New York, N. Y., Research Assoc. in Parasitology, DeLamar Institute of Public Health

Barbara J. Klever, 1341 S. Parton St., Santa Ana, Calif., Laboratory Technician, Orange County Health Dept.

Barbara Lang, Box 36, Poquonock, Conn., Sanitary Chemist, State Dept. of Health

Thomas L. Martin, Ph.D., 20 E. 9 North, Provo, Utah, Prof. of Bacteriology, Brigham Young University

Martha Michelbacher, Ph.G., 1701 Thousand Oaks Blvd., Berkeley 6, Calif., Bacteriologist, State Dept. of Public Health

Rosemary L. Noakes, 1307 Second Ave., San Francisco 22, Calif., Laboratory Technician, G. W. Hooper Foundation for Medical Research

Jose E. Ortiz, St. Lukes Hospital, Ponce, Puerto Rico, Medical Technologist

Mrs. Quay DeBure Rice, 154 Mills Ave., Spartanburg, S. C., Medical Technician, Laboratory, Station Hospital, Camp Croft

Lillian Rodofsky, 27 Summer St., Revere, Mass., Asst. in Bacteriology Dept., Tufts Medical School, Boston

Mary E. Rymer, 751 E. Platte Ave., Colorado Springs, Colo., City Chemist and Bacteriologist

Lt. Benjamin Shapiro, Sn.C., 101st General Hospital, Camp Grant, Ill., Laboratory Officer

Mildred B. Talley, 909 Wood Ave., Waco, Tex., Junior Serologist, Waco McLennon County Health Unit Lab.

Shirley E. Wilson, 2846 Forest Ave., Berkeley, Calif., Bacteriologist, Div. of Labs., State Health Dept.

I. Jaques Yetwin, M.D., 148 Crescent St., Waltham 54, Mass., Assoc. Prof. of Parasitology and Tropical Medicine, Middlesex University School of Medicine

Vital Statistics Section

Karl F. Heiser, Ph.D., 203 State Office Bldg., Hartford, Conn., Director of Research, Public Welfare Council

Betty W. King, 614 Central, Salinas, Calif., Vital Statistician, Monterey County Health Dept.

Helen Maher, Tennessee Valley Authority, Chattanooga, Tenn., Statistician, Health and Safety Dept.

Engineering Section

Capt. Amos J. Alter, P. O. Box 2868, Juneau, Alaska, Passed Assistant Sanitary Engineer, U. S. Public Health Service

William C. Blankenship, Pulaski County Court House, Little Rock, Ark., County Sanitarian, Pulaski County Health Dept.

Paul J. Cerny, 603 B.M.A. Bldg., Kansas City 8, Mo., Sanitary Engineer (R), U. S. Public Health Service

Irving F. Gaskin, Office of the Medical Officer of Health, Siparia, Trinidad, B.W.I., Sanitary Inspector, Government Sanitary Services

William V. Hickey, 757 7th Ave., Salt Lake City, Utah, Chief Sanitarian, City-Board of Health

Malcolm C. Hope, M.S., 603 B.M.A. Bldg., Kansas City 8, Mo., Passed Assistant Sanitary Engineer (R), U. S. Public Health Service

William A. Legwen, M.S., P. O. Box 1095, Macon, Ga., Passed Assistant Sanitary Engineer (R), U. S. Public Health Service

Harold B. Robinson, M.S., 617 Colorado Bldg., Denver 2, Colo., Passed Assistant Sanitarian, U. S. Public Health Service

Darold W. Taylor, 2124 N. Nevada, Colorado Springs, Colo., Asst. Sanitarian (R), U. S. Public Health Service

George P. Umberger, 2230 K. St., Sacramento, Calif., Sanitarian, Sacramento County Health Dept.

Joseph E. Williams, Summerlee Ave., Oak Hill, W. Va., Sanitarian, State Health Dept.

Industrial Hygiene Section

Arthur V. Diedrich, D.D.S., 14015 Gratiot Ave., Detroit 5, Mich., Chairman, Industrial Dental Programs Committee, State Dental Society

Lt. Col. Jean S. Felton, M.C., Station Dispensary, Fort Mason, Calif., Industrial Medical Officer

J. Brennan Gisclard, M.S., 727 N. Capitol Ave., Lansing 6, Mich., Chief Chemist, Bureau of Industrial Hygiene, State Dept. of Health

Paul D. Halley, 1584 E. Washington St., Charleston 1, W. Va., Assoc. Industrial Hygienist, State Health Dept.

Gertrude A. Stewart, R.N., 4801 Connecticut Ave., N.W., Washington, D. C., Supervisor,

Medical Dept., International Business Machines Corp.

N. A. Talvitie, 631 Second Ave., West, Seattle 99, Wash., Industrial Hygiene Chemist, State Dept. of Health

Ella Mae Watson, R.N., 1430 Sacramento St., San Francisco 9, Calif., Industrial Nursing Consultant, State Dept. of Public Health

Food and Nutrition Section

Diamond A. Ballin, M.A., 55 Shattuck St., Boston, Mass., Student, Harvard School of Public Health

William J. Darby, Ph.D., Box 1042, Chapel Hill, N. C., Director of Medical Nutrition, State Board of Health

Clarence L. Edwards, Quincy Health Dept., Quincy, Mass., Food Inspector

Dorothy W. Gaunt, 1505 Harrison Blvd., Boise, Idaho, Nutritionist, American Red Cross

Walker L. Loving, Ph.D., 618 Volunteer Bldg., Atlanta, Ga., Assoc. Sanitarian, U. S. Public Health Service

Maurine Meier, 3200 Eastern, Oklahoma City, Okla., Nutritionist, State Health Dept.

Maternal and Child Health Section

George F. Davidson, Ph.D., 245 Cooper St., Ottawa, Canada, Exec. Director, The Canadian Welfare Council

Lucille J. Marsh, M.D., 3326 Park, Jacksonville, Fla., Director, Bureau of Maternal and Child Health, State Board of Health

Public Health Education Section

Madge Bartlett, P. O. Box 3548, Orlando, Fla., Exec. Sec., Orange County Tuberculosis and Health Assn.

Gladys T. Daniloff, 604 Mission St., San Francisco 5, Calif., Exec. Sec., Heart Committee, San Francisco Tuberculosis Assn.

Arthur H. Estabrook, Ph.D., Room 607, 311 S. Juniper St., Philadelphia, Pa., Sec., Mental Hygiene and Public Health Division, Public Charities Assn. of Pennsylvania

D. Frank Holtman, Ph.D., University of Tennessee, Knoxville, Tenn., Prof. and Head of Dept. of Bacteriology

Frederick E. Kidder, Castaner General Hospital, Adjuntas, Puerto Rico, Director, Public Health Program

Laurence R. Kirk, 2235 N. St., Sacramento, Calif., Exec. Sec., Sacramento Tuberculosis Assn.

Mary E. Leonard, 16 Crockett Ave., Dorchester 24, Mass., Health Education Worker, Southern Middlesex Health Assn.

Helen H. Lynaugh, R.N., Box 150, Bonifay, Fla., County Public Health Nurse, State Board of Health

Randall R. MacLean, M.D., Provincial Mental Hospital, Ponoka, Alta., Canada, General Medical Supt.

Jay E. McCarthy, Room 521, Phelan Bldg., San Francisco 2, Calif., Health Educator, State Dept. of Public Health

Marion L. Meigs, 5 Lodge St., Albany 7, N. Y., Health Education Director, Young Women's Christian Assn.

Robert E. Nims, 824 Fayette Ave., Springfield, Ill., Film Exhibits Technician, State Dept. of Public Health

Arthur C. Painter, 33 Hunt St., San Francisco, Calif., Venereal Disease Educator, San Francisco Dept. of Public Health

Dr. Jose L. Pineda, International House, Berkeley, Calif., Director of Malaria Control, Inter-American Cooperative Health Service

Miriam Rogers, The Stamford Hospital, Stamford, Conn., Tumor Clinic Sec.

Henriette Strauss, Dept. of Preventive Medicine, 615 N. Wolfe, Baltimore 5, Md., Director of Visual Health Education, Johns Hopkins Medical School

Margaret A. Walcott, M.A., 203 County Court House, Pensacola, Fla., Exec. Sec., Escambia County Tuberculosis and Health Assn.

Public Health Nursing Section

Aline Batson, 5926 Perrier St., New Orleans, La., Field Supervisor, Child Welfare and Community Health Assn.

Lora I. Battin, 527 Broadway, Quincy, Ill., Supervising Nurse, Adams County Defence Zone Health Dept.

Alice Christianson, M.P.H., 305 Greenwood, Topeka, Kans., Asst. Public Health Nursing Consultant, U. S. Public Health Service

Idabel Durgan, R.N., 325 N. Cleveland St., Orange, Calif., Director of Public Health Nurses, Orange County Health Dept.

Gertrude M. Embury, 606 Spencer Ave., Santa Rosa, Calif., Supervisor of Public Health Nurses, Richmond Health Dept.

Grace W. Fisher, R.N., Ravenswood, W. Va., Public Health Nurse, State Health Dept.

Helen E. Kinney, A.M., 6172 Delafield Ave., New York 63, N. Y., Instructor, Public Health Nursing Dept., Seton Hall College

Nettie Kirchhoff, R.N., Nursing Div., State Dept. of Health, Austin, Tex., Field Supervising Nurse

Ruth Laine, 1822 Unionport Rd., New York, N. Y., Supervisor of Welfare Room, American Red Cross

Christine Mackenzie, M.A., R.N., 1455

Lincoln Way, San Francisco 22, Calif., Asst. Prof. in Public Health Nursing, University of California

Lida S. Murphy, R.N., P. O. Box 71, Lakeport, Calif., Lake County Public Health Nurse

Christiana Olafson, R.N., Hays Sub-Agency, Hays, Mont., Public Health Nurse, U. S. Office of Indian Affairs

Coretta Pharris, 640 Brady St., Apt. 202, Dearborn, Mich., Staff Nurse, Wayne County Health Dept.

Anne Poore, R.N., 114 Morningside Drive, New York, N. Y., Asst. Supervisor, Henry Street Visiting Nurse Service

Jane B. Taylor, R.N., 703 Harrison St., Topeka, Kans., Venereal Disease Nursing Consultant, State Board of Health

Maisie Wetzel, M.S., 1206 S.W. Gibbs, Portland, Ore., Asst. Director of Nursing Education, University of Oregon Medical School

Charlotte E. Wilson, 242½ Glendale Blvd., New Orleans 20, La., Supervisor of Nurses, City Health Dept.

Lulu K. Wolf, R.N., 2014 Cedar Lane, Nashville 4, Tenn., Prof. of Nursing Education, Vanderbilt University School of Nursing

Epidemiology Section

David A. Cooper, M.D., 1520 Spruce St., Philadelphia 2, Pa., Chief, Div. of Tuberculosis, City of Philadelphia

W. Derrel Hazlehurst, M.D., County Health Dept., Fayetteville, N. C., Passed Assistant Surgeon, U. S. Public Health Service

Major Oliver R. McCoy, M.C., 2806 31st St., S.E., Washington, D. C., Director, Tropical Disease Control Div., Office of the Surgeon General, U. S. Army

Lt. Col. Thomas H. Sternberg, M.C., 1818 H. St., N.W., Washington, D. C., Director, Venereal Disease Control Div., Preventive Medicine Service, Office of the Surgeon General, U. S. Army

Major Douglass W. Walker, M.C., 4816 29th St., South, Arlington, Va., Exec. Officer, Preventive Medicine Service, Office of the Surgeon General, U. S. Army

Luke M. Watson, M.B., M.P.H., Health Dept., Kingston and St. Andrew, Cross Roads P. O., Jamaica, B.W.I., Medical Officer of Health

Charles C. Wedderburn, M.B., M.P.H., 4 Stanton Terrace, Liguanea P. O., Jamaica, B.W.I., Venereal Disease Control Officer, Jamaica Government Medical Service

Herbert A. Wenner, M.D., Yale University Dept. of Prev. Med., New Haven, Conn., Instructor in Preventive Medicine

School Health Section

Abraham Braverman, M.D., 1931 Vyse Ave., Bronx, N. Y., Medical Inspector of Schools, City Health Dept.

Margaret A. Cree, 509 Phelan Bldg., San Francisco, Calif., Maternal and Child Health Nursing Consultant, State Dept. of Public Health

William J. Dougherty, M.D., 101 N. Railroad Ave., Frackville, Pa., Medical Inspector, Frackville Schools

Herman B. Katzman, M.D., 665 Ocean Parkway, Brooklyn, N. Y., Cardiologist, City Health Dept.

Philip Ollstein, M.D., 1015 Washington Ave., Brooklyn 25, N. Y., Supervising School Physician, City Health Dept.

Virginia M. Palmer, M.D., 2 Herbert Ave., White Plains, N. Y., School Physician, White Plains Public Schools

Ethel H. Priest, M.D., Napa Junior College, Napa, Calif., School Physician

Clara S. Shepherd, M.D., City Health Board, City Hall, Lansing, Mich., School Physician

Lloyd E. Webster, M.A., 808 North Spring St., Los Angeles 12, Calif., Director, Div. of School Health Education, Los Angeles County Schools

Dahlia Whitbourne, M.B., Public Health Office, Cross Roads P. O., Jamaica, B.W.I., Asst. Medical Officer of Health, Kingston and St. Andrew Corp.

Dental Health Section

Max K. Baklor, D.D.S., 2201 Eutaw Place, Baltimore 17, Md., Lecturer in Dental Hygiene, School of Nursing, Sinai Hospital

Dr. Stanley C. Brown, Ithaca, Mich., Dentist

Russell W. Bunting, D.D.S., 916 Church St., Ann Arbor, Mich., Dentist

L. A. Cadarette, D.D.S., 630 E. Jefferson, Detroit 26, Mich., Dentist

Crown O. Diehl, D.D.S., 208 Professional Arts Bldg., Hagerstown, Md., Vice President, Washington County Public Health Assn.

Kenneth R. Gibson, D.D.S., M.S.P.H., 660 Frederick St., Detroit 2, Mich., Director of Dentists, Childrens Fund of Michigan

Sophie Gurevich, D. C. Health Dept., 300 Indiana Ave., N.W., Washington 1, D. C., Senior Public Health Dental Hygienist, Bureau of Dental Services

Herbert F. Hess, D.D.S., 9400 Euclid Ave., Cleveland, Ohio, Asst. Supervisor of Mouth Hygiene, Cleveland Public Schools

Phoebe Jarvi, 2750 North Cramer St., Milwaukee 11, Wis., Dental Hygienist, Milwaukee Childrens Hospital

Walter C. McBride, D.D.S., 660 Fisher Bldg., Detroit 2, Mich., Dentist

Frank J. McClure, Ph.D., National Institute of Health, Bethesda, Md., Senior Biochemist

John P. Riedel, D.D.S., P. O. Box 448, Fresno 9, Calif., Supervising Dentist, State Dept. of Public Health

Thomas N. Talty, D.D.S., 1535 S. Kimbrough, Springfield, Mo., Staff Member, Metro Dental Clinic

Dr. Drew H. Turner, Box 210, Jacksonville, Fla., Director, Bureau of Dental Health, State Board of Health

Marcus L. Ward, D.D.S., 1308 Cambridge Rd., Ann Arbor, Mich., Johanathan Taft Professor of Dentistry, School of Dentistry, University of Michigan

Unaffiliated

Charlotte Andress, A.M., 6151 South Drexel, Chicago, Ill., Instructor, Dept. of Public Health Nursing, Loyola Univ.

George Bugbee, 18 E. Division St., Chicago 10, Ill., Exec. Sec., American Hospital Assn.

Seymour M. Farber, M.D., San Francisco Hospital, Portero and 23rd St., San Francisco, Calif., Teacher, University of California Medical School, Dept. of Medicine

James Lieberman, D.V.M., 29-05 Parsons Blvd., Flushing, N. Y.

Helen Paull, 1228 N. Broadway, Santa Ana, Calif., Physiotherapist, County Health Dept.

Mildred C. J. Pfeiffer, M.D., 6830 Old York Rd., Philadelphia 26, Pa., Physician, Community Health Center

DECEASED MEMBERS

Meta DeLoache, Paterson, N. J., Elected Member 1941, Public Health Education Section

Aurelia B. Potts, R.N., Nashville, Tenn., Elected Member 1928, Elected Fellow 1934, Public Health Education Section

Dr. Rafael Silva, Mexico City, Mexico, Elected Member 1930, Health Officers Section

CLIFFORD C. YOUNG, D.P.H.

Dr. C. C. Young, for many years Director of Laboratories, Michigan State Health Department, died on June 5.

Dr. Young was born in Kansas, and educated at the University of Rochester and the University of Kansas. He received the degree of Doctor of Public Health from the University of Michigan in 1924. His vision and energy have placed the Michigan State Health Department Laboratories among the most outstanding in the country.

Dr. Young was elected to membership in the Association in 1912. He was a charter Fellow. He served three terms on the Governing Council, was Chairman of the Laboratory Section in 1928, and Chairman of the Committee on Meetings and Publications from 1930 to 1935. He was a member of the Executive Board at the time of his death, having been elected for a three year term in 1941.

CLOSING DATE FOR SUBMITTING FELLOWSHIP APPLICATIONS

Members who may be interested in applying for Fellowship in the A.P.H.A. are hereby advised that Fellowship applications should be received by the Central Office not later than August 1, to insure consideration at the Second Wartime Public Health Conference and 73rd Annual Business Meeting to be held in New York October 3 to 5.

EMPLOYMENT SERVICE

The Association Employment Service seeks to bring to the attention of appointing officers the names of qualified public health personnel and to act as a clearinghouse on employment. This is a service of the Association conducted without expense to the employer or employee.

From the registry of persons available, selected announcements are published from time to time. Appointing officers may obtain lists of all registrants on request.

Address all correspondence to the Employment Service, American Public Health Association, 1790 Broadway, New York 19, N. Y.

POSITIONS AVAILABLE

Wanted: A physician trained in tuberculosis to assume administrative control of the Bureau of Tuberculosis in an eastern city of 200,000 population. Salary $4,500–$5,031 plus cost of living adjustment. Address **Box B**, Employment Service, A.P.H.A.

Michigan announces civil service positions now open for orthopedic public health nurse, Grades II and III classes with the Michigan Crippled Children's Commission. Salary range: Grade II $230 to $270 per month; Grade III $280 to $340 per month. Grade II not under 23, Grade III not under 25. Must have completed course in orthopedic nursing or physical therapy in approved school. For Grade III position a full-time course of at least 9 months' duration is required. Must have 3 years' experience in public health nursing, one year of which shall have been in supervisory capacity. For Grade III position one additional year of nursing and one additional year of supervisory experience required. Eligibility for certificate in public health nursing and registration as a nurse in Michigan. For further information write Michigan Civil Service Commission, 310 No. Grand Ave., Lansing 4, Mich.

Wanted: Medical Social Worker for Dept. of Health, Peoria, Ill. Address Director Maternal and Child Health, Dept. of Health, Peoria, Ill.

Industrial Hygiene Toxicologist. Calls for person of chemical or chemical engineering background. Position, supervising of chemical work of industrial hygiene service and industrial hygiene laboratory; designing special apparatus for field studies on occupational disease problems; conducting field and laboratory analyses of toxicological exposures in industry; keeping records, interpreting results and preparing records. Requirements, knowledge of chemical laboratory methods and equipment; procedures for qualitative and quantitative analysis of organic and inorganic chemistry; knowledge of chemical methods of determining toxic materials in industry; familiarity with petrographic methods of mineralogical analysis. Immediate temporary appointment will be made, to be followed later by civil service examination to determine permanent status. Salary $2,900 base, plus $100 a year war adjustment, or total of $3,000 per year. Travel expenses also allowed. Must be U. S. citizen. Resident of any state may apply. Write J. Lynn Mahaffey, M.D., Director of Health, State Department of Health, Trenton 7, N. J.

Wanted: Public Health Nurse. Salary $175 per month and full maintenance, plus $25 per month for car expense. Must furnish own car. Write Paul D. Crimm, M.D., Director Boehne Tuberculosis Hospital, Evansville 12, Ind.

Assistant Sanitarian in well established Ohio department of health. Minimum experience 2 years required. Merit system prevails. Salary $1,800–$2,400. Write **Box K**, Employment Service, A.P.H.A.

Wanted: A physician with venereal disease control experience to assume directorship of the Bureau of Venereal Diseases in a large northeastern city. Salary $4,500–$5,000 per year, plus cost of living adjustment and travel allowance. **Box E**, Employment Service, A.P.H.A.

Wanted: Physician (male), American citizen, draft exempt, trained in pediatrics, for a 3 year position as chief resident and research assistant in fine pediatric tuberculosis hospital, New York. Good salary and maintenance. Only one intensely interested in research need apply. Send full details of qualifications and photograph. **Box R**, Employment Service, A.P.H.A.

Wanted: X-ray technician to travel with portable x-ray unit taking chest x-rays at tuberculosis case finding clinics. Includes both industrial and school surveys. Salary $35 per week plus travel and maintenance when away from headquarters. Address **Box M**, Employment Service, A.P.H.A.

Physician wanted as Director of Maternal and Child Health in western county health department. Preferably with training in pediatrics and venereology. Some venereal disease control work also. Man preferred but woman considered. Must be in good health. Salary $4,500 per year with car and expenses furnished. Position for duration of war. Address **Box S**, Employment Service, A.P.H.A.

Tuberculosis Association in large western city seeks a director of medical social work. Attractive position now open in agency with a dynamic program closely related to official groups. Address **Box D**, Employment Service, A.P.H.A.

U. S. Indian Service seeks physicians for service in the United States and Alaska. Address Office of Indian Affairs, Health Division, Merchandise Mart, Chicago 54, Ill. Application blanks will be furnished upon request.

St. Louis, Mo., Health Division, Industrial Hygiene Service, seeks two industrial hygienists, either engineers or chemists. Salaries $225 to $250 per month depending on qualifications and experience, plus travel allowances. Address Robert M. Brown, Public Health Engineer, 64 Municipal Courts Bldg., St. Louis 3, Mo.

Wanted: Medical technologists for 550 bed approved California hospital. Give full particulars and state salary desired. Address W. O. Brown, M.D., Kern General Hospital, Bakersfield, Calif.

Wanted: Medical technologist, woman, trained in bacteriology of milk and water, diagnostic cultures, routine blood chemistry and tissue work—paraffin and frozen sections. County position under Civil Service located in the East Salary to be arranged. Write **Box L**, Employment Service, A.P.H.A.

Public Health Nurses Wanted: Three staff positions available. Generalized program. Annual salary $2,220 to $2,400 plus travel for use of own car. Address Miss Lorilla Britell, Supervisor, King County Health Dept., County-City Building, Seattle 4, Washington.

Health Department of Southern City and County in a rapidly expanding industrial area, population exceeding 200,000, wishes to employ a Director of Division of Preventable Diseases. Salary commensurate with training and experience, $4,100–$4,700 plus allowance for travel. Write **Box P**, Employment Service, A.P.H.A.

Wanted: Bacteriologist or serologist, junior grade, with public health experience preferred, to work in County Laboratory acting in capacity of a State Branch Laboratory. Permanent position, salary $168 per month with advancement if satisfactory. Apply to Dr. R. G. Beachley, Director of Health and Welfare, Arlington County Health Department, 1800 N. Edison St., Arlington, Va.

Nutritionist-dietician. Services of an outstanding nutritionist or dietician desired for research work in food industry. Salary ($5,000–$8,000) dependent on qualifications. Reply should state complete detailed educational background and experience. Apply **Box F**, Employment Service, A.P.H.A.

Community Health Educator. Wanted a woman, well trained and experienced in modern methods of organizing and conducting health education among neighborhood groups and other adults. Proper personal qualifications essential and would like person having Master's degree. Office with progressive private agency in city, but work chiefly in adjoining suburban and rural areas. Good salary and allowance for automobile expenses. State age, training, positions held, and give references. Address Arthur W. Towne, Secretary, Onondaga Health Association, Loew Building, Syracuse 2, N. Y.

Bacteriologist Wanted with minimum of master's degree in bacteriology and one year's experience in an approved public health laboratory. Woman or draft exempt man, to take charge of newly established, newly equipped laboratory. Must be able to carry out all the usual procedures of a public health laboratory. Write full details including minimum starting salary requirement. All letters including vitae and photo will be promptly acknowledged. Address E. E. Palmquist, M.D., King County Health Department, 402-L County-City Building, Seattle 4, Wash.

Wanted: A Vital Statistician to assume directorship of the Bureau of Vital Statistics in a large northeastern city. Salary $2,500–$3,100, plus cost of living adjustment. Write **Box G**, Employment Service, A.P.H.A.

Wanted: County Public Health Nurse for midwestern state. Present salary $160 per month and travel allowance. Must have had previous experience in public health. Own and drive car. Address District Health Unit 2, West Branch, Mich.

Physician—public health pediatrics. To assist director of maternal and child health in a large California County Health Department. Major duties, conducting of infant and preschool health conferences and school examinations. Beginning salary $390 a month and travel allowance. California license required. Training and experience in pediatrics or public health or both. Immediately available. Address William C. Buss, M.D., Kern County Health Dept., Bakersfield, Calif.

Wanted: Superintendent and Medical Director for tuberculosis sanatorium having 65 bed capacity and average of 35 patients per day. Salary $4,380 with $300 annual allowance for car. Write M. P. Hunter, City Manager, Roanoke, Va.

FOR OTHER POSITIONS AVAILABLE WRITE EMPLOYMENT SERVICE, AMERICAN PUBLIC HEALTH ASSOCIATION, 1790 BROADWAY, NEW YORK 19, N. Y.

In view of the current active demand for trained and experienced persons in public health, it is suggested that prospective employers communicate directly with the Employment Service, American Public Health Association, 1790 Broadway, New York 19, N. Y., for up-to-date lists of applicants.

POSITIONS WANTED

ADMINISTRATIVE

Woman physician, experienced in public health education and school health service administration and supervision, seeks full- or part-time position, preferably southeastern New York State. **A-511**

HEALTH EDUCATION

Woman with background of health education and public health nursing, experienced as teacher, supervisor, and writer, seeks teaching position of responsibility. **H-507**

ENGINEER

Well qualified public health engineer seeks responsible position in New York metropolitan area. **E-480**

Sanitary Engineer, C.E. 22 years' experience as sanitary engineer, 14 as director in state health department, now employed. Desires change. Location immaterial. **E-481**

LABORATORY

Research bacteriologist. Unusually trained and experienced woman bacteriologist and serologist now occupying responsible position in state laboratory seeks research work of permanent character. **L-468**

Water chemist, bacteriologist, M.S. degree in Sanitary Chemistry. Age 36, draft exempt. Eight years' experience in state laboratory working on water, milk and sewage. Prefers Midwest or Pacific Northwest location. **L-469**

Research bacteriologist - veterinarian, now in civil service, desires change to direct or indirect war work. P-3 classification. Considerable laboratory and field experience. Used to foreign travel; will go anywhere. Steady hard worker. **L-470**

Bacteriologist, 29, draft exempt, 3 years' experience public health laboratory, 2 years' experience industrial organization. Experienced in investigation and control activities on water, sewage, and sanitation as chemist, bacteriologist and serologist in syphilis and enteric diseases. **L-465**

Bacteriologist-Serologist, male, with 20 years' experience in state and municipal public health laboratories, last 10 years in administrative capacity, now in charge of a midwest diagnostic laboratory, wishes to make a permanent change. **L-427**

MISCELLANEOUS

Public Health Nurse. B.S. in nursing, William and Mary College, age 53, seeks position as coördinator of public health nursing, educational director, or director student nurse public health program. Prefers Middle Atlantic States. **M-452**

NEWS FROM THE FIELD

MICHIGAN STATE COUNCIL OF HEALTH

At the first meeting of the Michigan State Council of Health held since the appointment of William DeKleine, M.D., as State Commissioner of Health, Henry F. Vaughan, Dr.P.H., Dean, School of Public Health, University of Michigan, was reëlected President of the Council, a position which Dr. Vaughan has held for the past five years. The other members of the Council include Harold E. Wisner, M.D., Detroit; John A. Galbo, D.D.S., Detroit; Wesley H. Mast, M.D., Petoskey; Charles L. Hess, M.D., Bay City.

PUBLIC HEALTH ASSOCIATION OF NEW YORK CITY

The Eighth Annual Meeting of the Public Health Association of New York City was held on May 17.

The proceedings opened with a session in the afternoon on "Debits and Credits in Public Health in Wartime in Our City." The three speakers were: Dr. Leona Baumgartner, Director, Bureau of Child Hygiene, Department of Health of the City of New York; Bailey B. Burritt, Chairman, Executive Council, Community Service Society; and Dr. Theodore Rosenthal, Director, Bureau of Social Hygiene, Department of Health of the City of New York.

At the dinner session, the speaker of the evening was Lt. Col. Paul H. Stevenson, Senior Surgeon (R), U. S. Public Health Service, who has recently returned from Burma. His topic was "Expanding Horizons."

Dr. John L. Rice, on behalf of the American Public Health Association, gave a brief report on the plans for the Second Wartime Conference of the A.P.H.A. to be held in October at Hotel Pennsylvania in New York. He read a message from Dr. Reginald M. Atwater, Executive Secretary of the A.P.H.A., urging all the local members to attend the sessions.

The officers elected to serve until the Annual Meeting in 1945, were:

President—Leverett D. Bristol, M.D.
First Vice-President—Sol Pincus, C.E.
Second Vice-President—John L. Rice, M.D.
Secretary-Treasurer—Frank Kiernan
New members of the Executive Board:
Arthur I. Blau, M.D.
Horace Hughes
Helen C. Manzer, Ph.D.
Gertrude Gates Mudge
Boyden Roseberry

Frank Kiernan was elected as representative to the Governing Council of the American Public Health Association.

NEW OFFICERS ELECTED AT RECENT MEETINGS OF SOME OF THE A.P.H.A. AFFILIATED SOCIETIES

West Virginia Public Health Association:

President—Edward B. Carroll, Morgantown
1st Vice-President—Margaret D. Arbuckle, Grantsville
2nd Vice-President—James E. Coleman, M.D., Fayetteville
Secretary-Treasurer—Annette King, Charleston

Illinois Public Health Association:

President—Sumner M. Miller, M.D., Peoria
President-elect—Howard J. Shaughnessy, Ph.D., Chicago
Secretary-Treasurer—Edward A. Piszczek, M.D., Chicago

Georgia Public Health Association:

President—Earl J. Sunkes, Dr.P.H., Atlanta
President-elect—Abe J. Davis, M.D., Augusta
Vice-President—Frances Sanchez, Albany
Secretary-Treasurer and Representative to the A.P.H.A. Governing Council—Louva G. Lenert, Atlanta

Connecticut Public health Association:

President—Mario L. Palmieri, M.D., Middletown
President-elect—Robert E. Purdue, M.D., Norwalk
Vice-President—Richard J. Hinchey, M.D., Waterbury
Secretary-Treasurer — Clement F. Batelli, M.D., New Haven
Representative to A.P.H.A. Governing Council—Paul H. Brown, M.D., Stamford
Alternate to A.P.H.A. Governing Council—Alfred L. Burgdorf, M.D., Hartford

Utah Public Health Association:

President—Eugene H. Bramhall, Salt Lake City
President-elect—Thomas L. Martin, Ph.D., Provo
Vice-President—LaVerna Peterson, R.N., Ogden
Treasurer—Welby W. Bigelow, M.D., Salt Lake City
Secretary—Elmer B. Quist, Salt Lake City

Idaho Public Health Association:

President—Milo T. Means, Boise
1st Vice-President — Stuart Robinson, D.D.S., Gooding
2nd Vice-President—Mrs. H. J. Maughan, Preston
3rd Vice-President—Mrs. Emma Clouchek, Twin Falls
4th Vice-President—Mrs. R. L. Brainard, Wardner
5th Vice-President—Mrs. R. A. Pomeroy, Twin Falls
Secretary—John W. Wright, Boise
Treasurer—Lucy Higgins, Boise

CORRECTION

In the JOURNAL for April, 1944, pages 335 and 347 in listing the members of the Commission on Acute Respiratory Diseases, inadvertently the name of Dr. A. E. Feller was omitted. The members are: Drs. John H. Dingle, Director, T. J. Abernethy, G. F. Badger, J. W. Beard, N. L. Cressy, Major M.C., A. E. Feller, A. D. Langmuir, C. H. Rammelkamp, J. M. Ruegsegger (resigned), and E. Strauss, 1st Lt., M.C.

PERSONALS

Central States

GEORGE F. CAMPANA, M.D.,† has been appointed Acting State Health Officer to succeed F. J. HILL, M.D.,† who has resigned as State Health Officer for North Dakota to accept the city health officership for Minneapolis, Minn. Dr. Campana has served as Director of the Division of Preventable Diseases of the North Dakota Department of Health since June, 1943, coming to Bismarck from New Rochelle, N. Y., where he was Acting City Health Officer.

JOHN H. GILPIN, M.D., Cheboygan, Mich., has been appointed District Health Officer of Cheboygan, Presque Isle, Montmorency, and Alpena Counties.

FRANK J. HILL, M.D., M.P.H.,† who for about three years has been State Health Officer of Bismarck, N. D., has resigned to accept appointment as City Health Commissioner of Minneapolis, Minn., succeeding F. E. HARRINGTON, M.D.,† who is retiring.

HUGO V. HULLERMAN, M.D., M.S. P.H.,* has been appointed Secretary of the Council on Professional Practice of the American Hospital Association, Washington, D. C. Dr. Hullerman was formerly Chief of the Division of Maternal and Child Health of the Illinois Department of Public Health, Springfield, Ill.

ALBERT T. PETERSON, formerly Director, Field Service with the Middle-

* Fellow A.P.H.A.
† Member A.P.H.A.

sex County Tuberculosis and Health League, New Brunswick, N. J., has recently accepted a position with the Denver Tuberculosis Society, Denver, Colo., as Health Education Secretary. Mr. Peterson is a graduate of Northwestern University and has had college teaching experience in the Midwest and in the East.

MARY E. SOULES, M.D., M.P.H.,† Director of Maternal and Child Hygiene for the North Dakota State Department of Health, Bismarck, N. D., has resigned.

BUELL H. VAN LEUVEN, M.D.,† Traverse City, Mich., has been appointed Health Director of Chippewa County, Mich.

JOHN P. WALSH, M.D.,† Wheaton, Ill., Health Officer of DuPage County, has been transferred to supervise a five county health unit with headquarters at Dixon.

Eastern States

JOHN HALL,* Freehold, N. J., recently Director of Health Education with the U. S. Public Health Service has been appointed Field Assistant with the American Social Hygiene Association, New York, N. Y. His first assignment is to the 8th Army Service Command, Texas, Oklahoma, New Mexico, Arkansas and Louisiana.

EMMA M. VARNERIN, M.D., has been appointed Assistant District Health Officer of the Division of Communicable Disease, State Department of Health, Boston, Mass.

Southern States

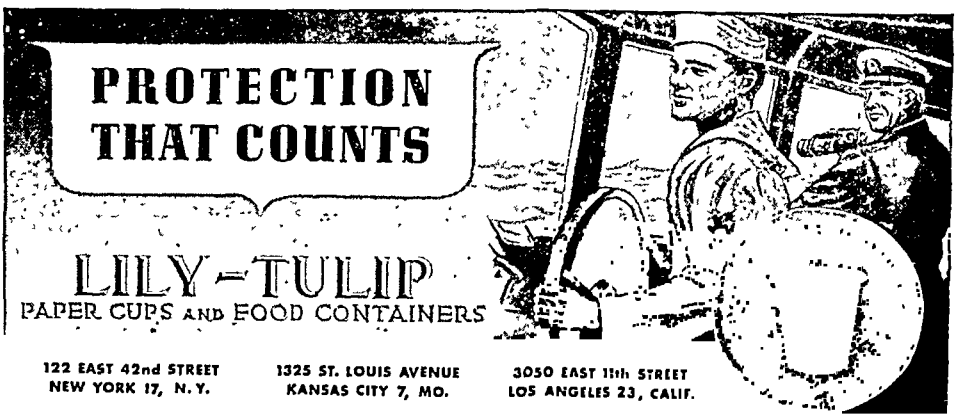
MARGARET H. ERVIN,† formerly with the Bellemead Coal Company, Sabine, W. Va., has accepted an appointment to the staff of the Laird Memorial Hospital, Montgomery, W. Va., as a clinical technician.

JAMES A. HAYNE, M.D.,* Columbia, S. C., State Health Officer for 33 years, has resigned.

BALLARD NORWOOD, JR., M.D.,† Oxford, N. C., has resigned as Health Officer of Granville County, N. C., to enter private practice.

BRIGADIER GENERAL JAMES STEVENS SIMMONS,* U. S. Army, Chief of the Preventive Medicine Service, Office of the Surgeon General, U. S. Army, Washington, D. C., has been elected as a member of the Council on Industrial Health of the American Medical Association.

* Fellow A.P.H.A.
† Member A.P.H.A.



American Journal of Public Health
and THE NATION'S HEALTH

Volume 34 August, 1944 Number 8

The Coöperative Health Program of the American Republics

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Major General, U. S. Army, Executive Vice-President, Institute of Inter-American Affairs, and Assistant Coördinator of the Office of the Coördinator of Inter-American Affairs, Washington, D C.

THE Inter - American Cooperative Health Service in the other American republics is a practical illustration of a united approach to the health problems of a neighborhood. The initiation of this extensive public health campaign was motivated by the recognized importance of concentrated measures for health protection throughout the Western Hemisphere. When extensive application lags behind well established knowledge, contagion can wax rampant and unrestrained. Preventable and curable sickness and death have in the past, and can still successfully hamper war effort and establish barriers in restraint of trade and economic development. With these well proven facts clearly in mind, 18 of the other American republics have embarked upon a joint program with the United States, to marshal forces against the insidious attack of fatal and debilitating enemies to well-being and efficiency.

There is ample evidence that the interchange of scientific knowledge including medical work in foreign countries is one of the most important factors in cementing international friendship. Public health work can serve not only to protect the people in other countries but is also of paramount importance for safeguarding our own population.

The Inter - American Cooperative Health Services were organized to assist and implement the good neighbor policy at a time when the threat of German conquest was most serious and every possible means had to be used to combat the powerful Axis influence in the Americas. The Japanese invasions of countries in the Far East cut off practically all of our important sources of rubber, tin, cinchona and other vital products. We had to depend upon the other American republics not only for supplies of important materials but also for coöperation in the defense of strategic areas.

The provision of medical and public health services for persons directly engaged in the war effort is an important

function of the Cooperative Health Services. The control of malaria has received major emphasis. General activities include such features as physical examinations, vaccination, emergency medical care, the distribution of medicines, and the provision and supervision of elementary sanitation. In this fashion an attempt has been made to improve the health and efficiency of the workers in rubber areas, on cinchona and sisal plantations, in the tin mines, and in the rich, diversified mining regions of Brazil, as well as highway and railroad workers in several of the countries. Sanitation and other public health measures have been intensified around air bases and in areas where our armed forces are stationed.

In addition to this work, which is largely of emergency and temporary character, the Coöperative Health Services are planned to supplement and extend existing activities and to introduce new patterns in the provision of a sound plan for immediate and long-term disease control.

In accordance with the prescribed directives for the extension of public health, the campaign includes increased opportunity for the utilization of therapeutic and preventive measures through the construction, equipping, and operation of hospitals, dispensaries, clinics, and health centers; fundamental and widespread activities for improved water supply systems, for sewage disposal, insect abatement, and other sanitary measures; training of professional workers in their specialties, and education of lay groups for the provision and practice of healthful living; and direction and evaluation of control measures through field and laboratory investigation. These are the activities being developed to realize the objectives expressed in January, 1942, at the third meeting of Ministers of Foreign Affairs of the American Republics at Rio de Janeiro.

The delegates of all 21 American republics agreed that:

> The defense of the Western Hemisphere required the mobilization of the vital forces, human and material, of the American republics and
>
> Adequate health and sanitary measures constitute an essential contribution in safeguarding the defensive powers and the ability to resist aggression of the peoples of the American republics.

Resolutions were adopted advocating the extension of inter-American cooperation in a plan designed to further well-being and strengthen the bonds between the nations of the Western Hemisphere. The Congress of the United States voted an appropriation and authorized the Coordinator to set up a corporate entity, the Institute of Inter-American Affairs, with power of attorney to administer funds and execute coöperative agreements with the other American republics.

The Health and Sanitation Division of the Office of the Coordinator of Inter-American Affairs was established in February, 1942, as one specialized branch of an organization that includes many other operations in informational and economic fields.

Close liaison is maintained with numerous governmental and civilian agencies. These include the Pan American Sanitary Bureau, the National Research Council, the Bureau of Medicine and Surgery of the Navy, the Office of the Surgeon General of the Army, the Army Medical School and the Army Medical Museum, the United States Public Health Service, the International Health Division of the Rockefeller Foundation, the Foreign Economic Administration, inter-American committees of professional associations, schools of public health, medical schools and universities.

The work now in progress in 18 of the Latin American republics is entirely on a coöperative basis. The funds

appropriated by the Congress of the United States for this purpose are administered through the Institute of Inter-American Affairs. This incorporated body has made a grant to each of the republics now coöperating.

The republic wishing to participate also contributes its share of funds, materials, and personnel. The direction of activities and the disbursement of the combined funds is determined by the joint agreement of a Chief of Party from the Institute and an appointee of the national government. The Chief of Party is the head of the coöperative organization known in most of the countries as the SCISP (Servicio Cooperativo Inter-Americano de Salud Publica), which is an integral part of the national department of health. In many places, the Service is continuing and extending activities previously initiated by the health departments, while in other countries, long needed programs are being introduced.

Directive, consultant, and technical personnel for the field parties are provided by both the division of health and sanitation and the health department of the republic, but the organizations are composed for the most part of nationals as professional and technical employees and other local workers. On January 1, 1944, there were about 200 members of field parties from the United States and 13,000 nationals of the other republics employed in the program, of whom some 600 were physicians, nurses, sanitary engineers, or other professional personnel. Practical nurses, sanitary inspectors, technicians, administrative personnel, and office employees numbered about 2,400 and 10,000 were skilled or unskilled workmen.

PREVENTIVE AND THERAPEUTIC SERVICES

Hospital or dispensary construction is under way or completed in 10 of the republics. In some instances this has consisted of repairs or additions to existing buildings. In others, badly needed new facilities are being constructed and equipped. Operation of infirmaries for Brazilian migrants is an important part of this program. In Ecuador, which has the largest hospital program, existing structures are being improved or replaced to provide more adequate in-patient care in 16 general hospitals, and two isolation, two maternity, a children's, and a tuberculosis hospital. Leprosaria are under construction in Paraguay and Peru.

In addition to buildings, other services are being provided for improved in-patient medical care such as sanitary facilities and surgical, laboratory, and x-ray equipment.

Health centers, clinics, and medical posts are of major importance in this plan for controlling the spread of disease. Over 100 such stations are now under construction or in operation throughout Latin America.

In El Salvador, the National Department of Health and the Service are coöperating in the development and expansion of health centers throughout the Republic. Four existing full-time centers in the principal cities now provide immunization, maternal and child health services, tuberculosis and venereal disease control, dental hygiene and laboratory facilities, with headquarters for nurses, sanitary inspectors, and other offices. The Health Department and the Service are providing permanent structures to replace the inadequate buildings now in use.

Fourteen centers have been maintained on a part-time basis by the National Health Department, and have made available certain health services such as vaccination and vital statistics. An attempt is now being made to extend the program as it functions in the full-time health units and to make maternal and child health and venereal

disease control services available on a part-time basis to 12 cities of from 5,000 to 15,000 inhabitants. The physicians in charge of the part-time work received a short intensive course in public health, provided chiefly by the staff of the Health Department with the assistance of a few of the outstanding physicians of San Salvador. The Service provided the allowance to each doctor for travel, subsistence and salary during the period of instruction. The entire cost of the operation of these health centers is being borne by the National Department of Health, with the exception of a limited supply of equipment and drugs necessary for the maintenance of the venereal disease program.

The Health Department has also provided doctors, sanitary inspectors, and full-time visiting nurses. The office space and certain supplies are in some instances being maintained by the local municipality.

The health center in Asuncion, Paraguay, was designed to provide clinic space in the building for tuberculosis, syphilis, leprosy, skin diseases, prenatal and maternal hygiene, clinics and a general medical diagnostic clinic to serve as a referral center. A diagnostic laboratory, x-ray rooms, pharmacy, and auditorium, demonstration center, and a waiting room are also on the ground floor. Offices of the Ministry of Health and the Director of Hygiene and branch departments are to be on the second floor.

Some medical care is being provided throughout the Amazon Valley by means of launches, and to workers on the Pan American Highway through mobile dispensaries. In the Republic of Honduras, five clinics and health centers operated by the Service reported 1,939 patients treated during a single month. By far the majority of the patients had malaria, with 887 cases reported, and intestinal parasitism was next in order of importance, with 276 cases.

SANITATION

The extension of environmental sanitation has its major emphasis on improved water supply and sewage disposal, with programs under way in 8 republics. In El Salvador, surveys of existing sanitary conditions within the city of San Salvador were undertaken to consider the problems of water supply, sewage disposal, garbage disposal, markets and slaughterhouses, in addition to health center activities and communicable disease control. Improvements in the water system were recognized as urgent, and three storage tanks have been completed, with provision for the chlorination of the entire water supply of the city. An improved and increased water supply is being provided for the city of Zacatecoluca. Sewerage systems are being constructed for San Miguel and Santa Tecla.

A country-wide community sanitation project is under way in Haiti. Facilities for excreta disposal, construction and sanitation of a rural market, and a slum clearance project have been completed at Port-au-Prince. Work is proceeding on similar projects in other communities, including small water supply systems, construction of public toilets, installation of school privies and septic tanks. In other republics the work also covers jail sanitation, garbage collection and disposal, and special projects involving supervision of sanitation at air bases and labor camps.

Near the upper end of the Rio Doce Valley at Itabira, State of Minas Gerais, Brazil, is probably the world's largest deposit of high-grade iron ore. There are also large deposits of manganese, mica, quartz, and other minerals in this valley. These resources cannot be fully developed without an extensive health and sanitation program to prevent and treat malaria and other diseases. Com-

panhia do Vale do Rio Doce has been formed with the Brazilian and United States Governments providing equal shares of the capital. The company will develop mineral resources and reconstruct the railway between Itabira and Vitoria, an Atlantic coast town in the State of Espirito Santo.

An agreement was entered into with the Companhia Vale do Rio Doce of Brazil and the Service for advice as to location and arrangement of labor camps and the supply and supervision of sanitary facilities.

The railroad is being relocated through a very low swampy region where malaria is endemic. Labor crews of 200 to 500 persons are provided for each unit of 10 kilometers of the right-of-way. About 27,000 persons, including workers and members of their families, are benefited by these activities of the Service. Epidemiological investigations and extensive malaria control measures are in operation in the camps. Sanitary supervision of the camps has included water supply and housing as main problems, with excreta disposal provided by bored hole latrines.

The sanitary engineering activities related to permanent mosquito control represent the most widespread type of environmental sanitation. Drainage, ditching and filling, and the construction of dikes and tide gates, as well as temporary control measures, have been initiated in 13 of the republics.

EDUCATIONAL MEASURES

The provision of training programs for professional workers in these republics has as its primary objectives the encouragement of specialization in medical and public health fields, to make available the services of an increasingly large and valuable group of well trained experts throughout the Americas. The Pan American Sanitary Bureau and the Rockefeller Foundation have done pioneer work in this field. The Division of Health and Sanitation is supplementing their activities by extending opportunities to increasing numbers of physicians, nurses, sanitary engineers, and other public health personnel for training in their specialties. A total of 142 persons from the other republics had already come to the United States by January 1, 1944, under the auspices of this program. Their courses of study include training in schools of public health, medical schools, hospitals, and other institutions and in urban and rural health organizations, and travel grants to observe the functions and activities of public health departments and other organizations in the United States.

A recent development is an intercountry training program which provides for limited periods of training, especially in field work, at selected places within the other republics.

Another important phase of the training program is the provision of nurses' training or organization of schools of nursing in Bolivia, Brazil, Colombia, Ecuador, El Salvador, Nicaragua, Paraguay, and Peru, with provision of or addition to buildings, equipment, and staffing. Together with this long-term coöperative program, short courses in practical nursing are also provided.

Short courses of instruction are being given locally in most of the countries to their own physicians in charge of full-time health centers, to sanitary inspectors and medical technicians. The courses are given by the staff of the coöperative program in collaboration with local health department or hospital staffs.

A proposed health center and field training station in the village of Boca del Rio, Mexico, will have the usual activities of a health unit for the welfare of the people and, in addition, will

offer intensive field training for physicians.

Health education of the lay public is recognized as essential to the recognition and popular support of the public health program. This is a function of all medical and public health activity through medical care, public health centers, and special disease control programs. Organized campaigns are under way or are being planned in almost all of the republics. In Paraguay, for example, the Department of Sanitary Education has arranged a series of regular radio programs on syphilis, tuberculosis and cancer, and a special "Health Week" series. Health films have been shown at educational meetings in schools, workers' centers, and factories. Articles are sent to the newspaper at regular intervals and a *Sanitary Bulletin* and special pamphlets are distributed to selected groups throughout the country. About 6,000 posters are displayed in public places.

The important contributions of laboratory and field investigation are being increased by the provision of facilities and personnel training in many of the coöperating republics, as well as by the use of services provided either by local existing laboratories or by those operated as a part of the coöperative program. Public health laboratories are being constructed in Bolivia, Brazil, Colombia, Ecuador, and Paraguay. Better diagnostic facilities will be available as a result of much of the hospital construction and, in many areas, as an important function of the coöperative health centers.

During May, 1943, a central nutrition laboratory for Colombia was established in Bogota. Analyses of salt, milk, fruit, vegetables, soil, and water have been made. The salt and water studies, indicating absence of iodine, are being used as the basis of a campaign against endemic goiter. The Institute of Epidemiology of Bogota has this nutrition research as one phase of its activities, which also include experimental work on typhus, bartonellosis, malaria, and rickettsiosis.

The laboratory work at health centers in Colombia has included blood counts; smears for rickettsia, blood parasites, and gonococci; serological reactions; and fecal, urine, and sputum examinations.

Extensive laboratory investigations are being conducted in Brazil where the staff, equipment, and buildings of the Malaria Control Service of the Northeast and of the Institut de Patologia Experimental Evandro Chagas, in Belem, were assigned to the Amazon Project of the Cooperative Service by the Brazilian government. The staff includes a trained entomologist, physicians, a microscopist, a photographer, technicians, and field inspectors. The activities of the Amazon Valley Laboratory include the investigation of malaria, filariasis, leishmaniasis and trypanosomiasis, in addition to routine laboratory work and teaching. Malaria studies have included species identification and the collection of parasitic and splenic indices. In the Belem area, the prevalence of filariasis in the human population and the infection rate in the intermediate host and vector have been studied. A survey is in progress to determine the species of *Phlebotomus* and their distribution in the Amazon Valley, and xenodiagnosis is being used in the study of trypanosomiasis. Routine laboratory work performed in conjunction with the Service activities has included bacteriological examination of clinical specimens, analyses of drinking water, blood matching, and stool and urine examinations.

CAMPAIGN AGAINST SPECIFIC DISEASES

Malaria—A primary objective in this crusade is the subjugation of malaria. The debilitation and destruction caused by this outstanding scourge are un-

equalled in severity and extent. Throughout most of the other American republics relentless war is being waged upon the mosquito and the parasites which it disseminates. Specific projects are in most instances preceded by entomological and engineering surveys; studies on incidence by obtaining splenic and parasitic indices; and the proportionate distribution of the species of malaria plasmodia. Engineering activities include the construction of dikes and tide gates, drainage, ditching, filling and spraying. Treatment and resultant control consist in the distribution of millions of tablets of atabrine from health centers and medical posts.

Coöperative malaria control has been initiated in Bolivia, Brazil, Colombia, Ecuador, Haiti, Peru, and Venezuela; and in each of the Central American republics, with activities concentrated along the route of the Pan American Highway. In Panama, the health and sanitation program consists entirely of some 50 projects devoted exclusively to suppressing the mosquito.

In the Amazon Valley, the emphasis is at present upon medical care for migrants and rubber workers, entailing the distribution of atabrine from infirmaries, medical posts, and dispensaries throughout the Valley. Mosquito control projects are likewise in operation, for with the overthrow of the heretofore triumphant and undisputed reign of the *Anopheles*, a vast region of potential resources should become available.

Extensive malaria control activities are being practised in many areas, but as illustrative of the program in a particular country, Honduras may be chosen as an example. Project No. 1, now completed, consisted of a reconnaisance survey in 18 principal cities of the republic for the purpose of securing an index of the amount of malaria in the country and to make certain initial technical studies in some of these cities to determine the practicability of instituting permanent malaria control. An initial sanitary survey was made of each town. Splenic indices and blood smears were obtained from representative groups of school children, mosquito surveys were conducted, and some topographical studies were made. Tables and maps were prepared showing mosquito and malaria distribution and rainfall data. The survey results were used in the concentration of attention on areas of primary importance.

A 22 acre lagoon near Amapala was found to constitute a prolific mosquito breeding area. The water is being cleared of matted growth and the borders freed of vegetation, with maintenance operations to be continued by the public works department of the municipality.

Temporary control was initiated in Choluteca with the location of breeding places and their periodic treatment with oil or Paris green. Permanent malaria control drainage initiated in this town is providing open drain channels to care for the run-off of rain water and thereby help eliminate mosquito-breeding water pools.

The surface water drainage system of the town of La Ceiba is being improved by re-laying certain portions of the system and by increasing its capacity through larger and more adequate size pipe.

Plans are being drafted for permanent malaria control operations in most of the towns, which have a combined population of over 100,000 persons to be directly benefited by these operations.

Tegucigalpa was omitted from the general survey as most of the information sought is already known for the capital city. As a result of engineering studies in certain sections of the city, a project is being devoted to oiling, or dusting, of stagnant pools in outstanding breeding areas and routine collec-

tion of larvae and adult mosquitoes. A permanent control project is being drafted for some areas.

In addition to the engineering activities, other public health services and medical care, including diagnosis and medical treatment, have been made available for the control of malaria among workers throughout the rubber producing area and along the Pan American Highway.

Health centers at Amapala, Choluteca, Nacaome, San Marcos de Colon, Tegucigalpa, and Trujillo distribute atabrine and information on the means of spread and of protection against malaria.

Tuberculosis — Tuberculosis is of serious import throughout the other American Republics, with mortality rates that in some areas are reported to exceed 500 per 100,000 population. A special concern of the health centers everywhere, and in some instances, of concentrated campaigns, tuberculosis control activities consist of case finding, education, study of contacts, provision of visiting nurses, and organization of record systems, supplemented by the construction of tuberculosis sanatoria.

According to the vital statistics collected by the National Department of Health, tuberculosis is one of the leading causes of death in Nicaragua. The department has an Administrative Division for Tuberculosis, but has been hampered by lack of facilities. The Service is starting a tuberculosis control project to provide the Department of Health with additional space and equipment. Health education and nursing personnel are being furnished through other Service projects, and facilities will include a mobile x-ray unit for case finding and follow-up clinics; x-ray equipment for taking of 4″ x 5″ films for the tuberculosis clinic of the Department of Health; and conversion of tuberculosis pavilions at the San Pablo Hospital, Bluefields.

Venereal Disease—The most extensive project involving venereal disease control is that conducted along the United States-Mexico border, in cooperation with the United States Public Health Service and the Pan American Sanitary Bureau. The Office of the Coordinator coöperated in this program by allocating the funds for the establishment and maintenance of the campaign as one of the many important special projects financed by this office. The activities include the awarding of special fellowships for study of venereal disease control; the organization and supervision of an educational campaign against venereal disease; and organization, supervision, and assistance in the execution of prophylactic measures. Enthusiastic participation by the Mexican Government is an important feature of the program.

In the Panama Canal Zone administrative services have been provided, including the establishment and maintenance of a central office of the Division of Venereal Disease Control of the Health Department of the Canal Zone.

At the request of the naval authorities, a coöperative project was initiated at Corinto, Nicaragua, for the maintenance of a clinic, at first primarily for examination of prostitutes, but since extended in the direction of a local venereal disease control program.

In health centers, dispensaries, and clinics throughout the republics emphasis is being placed upon the control of venereal disease. As a part of the health center program in El Salvador, for example, the attendant-physicians in 12 part-time health centers were provided with supplies of drugs for the maintenance of venereal disease clinics, and a strenuous attempt is being made to follow up contacts and bring them into the clinic for treatment.

Intestinal Parasites—Parasitic infestation is extremely widespread throughout the other Americas and it has been

estimated that, in some areas, 90 to 100 per cent of the population harbor intestinal parasites. The provision of safe water supplies and sewage disposal is a major means of combating this health hazard. These measures are supplemented by services directed principally through health centers and dispensaries for surveys of infested areas, health education programs, and mass treatment of infected persons.

At Tingo Maria Hospital, in Tingo Maria, Peru, a program has been developed for an intensive campaign against hookworm. Attempts will be made to examine the entire population of selected areas for hookworms, distribute and supervise the administration of hexylresorcinol, stimulate and perhaps subsidize in a small degree the construction of sanitary privies, and endeavor to make general the wearing of shoes.

Yaws—In Colombia, the Pacific Coast Sanitary Campaign has as its special objective the control of infectious diseases in the swampy lowlands along the southern part of the Pacific Coast where four health centers have been established. The treatment of yaws is a major feature of the program now being extended to areas further north in which the incidence of yaws is also high.

An important activity of the anti-yaws campaign in Haiti is the training of local personnel to assist in the organization and operation of rural treatment centers. According to Health Department records, there are estimated to be about 300,000 cases of yaws in Haiti. Attendance at the first yaws clinic opened at Gressier increased from 158 in March, 1943, to 917 in April, 2,181 in May, and 11,915 in October.

Typhus—Typhus fever study and control are under way in Colombia, El Salvador, and Guatemala. Plans have also been made for a coöperative project with the Pan American Sanitary Bureau for work in southern Bolivia. A research project on typhus fever in El Salvador is concerned with the isolation of the virus from rats as well as from patients. In Colombia, laboratory study of arthropods and blood specimens has been extended, and a roving commission is conducting experimental vaccinations. In Guatemala, epidemiological studies are being made to determine the prevalence of this disease with concomitant measures for control, including immunization of contacts and elimination of insect vectors. A serologist from the Army Medical School Laboratory spent two months in Guatemala City doing laboratory work during the preliminary survey and training technicians.

During October, 1943, a typhus outbreak occurred in a textile factory engaged in work directly associated with the war effort. Approximately 40 deaths had occurred from typhus during July and August, among a population of 1,000 factory workers and their families. In an attempt to control further spread of the disease, the owners of the factory agreed to hire a full-time medical officer and the necessary number of assistants, as well as to provide all the medical supplies. The National Health Department agreed to provide supervision and consultative medical services, and the Service agreed to provide personnel for teaching the medical staff and sanitary inspectors employed by the factory.

Plague—In Bolivia and Ecuador, plague control measures have been undertaken in conjunction with the Pan American Sanitary Bureau and local health authorities.

Work began in February, 1943, in an area in the south central part of Bolivia where bubonic plague has been endemic for a number of years, and several serious localized epidemics have occurred. Large numbers of domestic

rats and their ectoparasites are being studied. Sylvatic plague is also reported to be present.

Suppressive measures in Ecuador are being extended along the Guayaquil-Quito Railway and particularly in the endemic rural area of the Province of Chimborazo. The campaign is being directed toward the extermination of rats, fleas, and guinea pigs, for it is felt that evidence points definitely to the guinea pig as an intermediate host between rat and man. Trapping, poisoning, cyano gas flame throwers, and insecticide sprays are being used, and rat and flea killing measures have been repeated two or three times in most of the area.

Bartonellosis—The service in Colombia inaugurated, in March, 1943, a campaign against bartonellosis. Studies are being conducted for the investigation of the epidemiology, the mode of transmission, of the disease and the possible development of a vaccine for prevention.

SPECIAL PROJECTS

The Institute of Inter-American Affairs has also authorized the allocation of funds for a number of special projects. These are not under the supervision of the Services but constitute separate activities, many of them under the immediate direction of the Pan American Sanitary Bureau, such as fellowships in military medicine; additional public health nurses requested by the other American republics; the visit of medical and public health experts from the other Americas to the meeting of the American Public Health Association, and to institutions and cities of special interest; the collection of biostatistical and epidemiological information from the southern republics; and onchocerciasis control in Guatemala and Mexico.

SUMMARY

The work of the Inter-American coöperative health program is directed toward the control of the spread of infectious disease and toward the promotion of health by preventive and therapeutic measures. The extension of international health work is fundamental in a world where diplomatic exchange of notes, political treaties, and the opening of channels of commerce and transportation have long been recognized as necessary for the progress of civilization. The Inter-American health program has already proved to be an efficient means of cementing the friendship and coöperation that were absolutely essential to the Western Hemisphere at the outbreak of the present world war. All the republics have profited by the exchange of ideas, personnel, and materials with which this campaign has been related. A pattern has been established for the introduction and extension of health measures that are of importance not only to the persons immediately concerned but also over a far-reaching area.

The threat of disease is especially ominous at this time, for the waging of war has always been attended by marked increase in the prevalence of contagion among civilians and soldiers alike. The present program operates not only toward the alleviation of debilitation and death at those places where specific measures are provided, but also toward the prevention of disease spread among distant as well as nearby population groups.

In some areas, the other Americas have spent millions of dollars and employed thousands of persons on communicable disease programs which have ultimately benefited the United States. The people of this continent are greatly indebted to the successful campaigns initiated in Brazil for the eradication of *Anopheles gambiae,* imported from Africa and an especially dangerous vector of malaria. The measures directed against the *Aedes aegypti* in

Brazil and Colombia have aided in the solution of a problem which might have resulted in devastation of our own shores and necessitated expensive measures against yellow fever. Our present coöperative services are waging a war to prevent the dissemination of disease from one country to another.

Disease has through the ages followed the lines of transportation. With the increasing frequency and rapidity of travel, especially in cargo and passenger planes, previously adequate quarantine restrictions are weakened not only by hitch-hiking insect vectors but also by the conveyance of regular passengers who have become infected and are deposited in unprotected communities during an incubation period that terminates only subsequent to arrival.

With the provision of preventive and therapeutic measures, hitherto disease-ridden areas become more accessible for cultivation and development. Such measures, more than any other, can serve to stimulate the production of some important tropical materials that in the past have been largely limited to the Far East.

The coöperative effort is now serving in the interests of increased efficiency for war products and, with opportunity for development, there will come the growing purchasing power which is the necessary basis for the extension of commerce and support of trade. By the exchange of students, the provision of health center and hospital services, widespread health education, the improvement of environmental sanitation, and the use of specific control measures, a coöperative effort is being directed toward the more efficient preservation and utilization of human and other resources.

Wartime Nutrition in England as a Public Health Problem*

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AT this meeting two years ago Sir Wilson Jameson, the Chief Medical Officer of the Ministry of Health, told you a little about the nutritional surveys that are being made in England by the Oxford Nutrition Survey. I should like first to expand what he said and then to make some broad generalizations about the conduct of such surveys. I feel encouraged to do this because those of us who work in the field of human nutrition have usually been so engrossed in cultivating our own small part of it that we have rarely put down our tools and stepped back to see what crops or even weeds we are growing, and I have been permitted at least to put down my tools during the ten weeks in which I have had the privilege of visiting nutritional projects in this country and in Canada at the invitation of The Rockefeller Foundation.

Let me first, then, tell you very briefly of the development and organization of the Oxford Nutrition Survey. Its first seeds were sown in the summer of 1940, and they suddenly sprouted and rapidly grew a year later. At that bad period of the war in England our food policy was designed, as it still is, to save shipping for military purposes by keeping the population on the lowest diet compatible with health. It was obviously important, therefore, to watch the nutriture of the population, and that could only be done by making nutritional surveys. In May, 1941, we started to make such surveys with the backing of the Ministries of Health and Food, endeavoring to include so far as our resources permitted all reasonable methods. Obviously that was slow and laborious, but it was necessary to try all methods because of the uncertainty—to my mind—of most of the suggested ways of assessing the state of nutrition. However, it was clear that if we had a central organization making surveys in and around Oxford to test, develop, and apply such methods, it would be possible also to have a mobile team that could go out from Oxford around the country and make quick surveys using the methods that had been found to prove most useful.

We now have such an organization in Oxford, making detailed surveys for public health purposes and carrying out essential research; and we have a mobile team of three persons which spends about two months in any one town and examines the members of upward of 70 families in that time. The primary purpose of the whole organization has been to discover the incidence, cause, severity, and distribution of malnutrition in England.

* Presented before the Food and Nutrition Section of the American Public Health Association at the Seventy-second Annual Meeting in New York, N. Y., October 14, 1943.

THE DEFICIENCIES REVEALED

The main survey has now examined about 4,000 subjects. Probably the most serious problem in England is ascorbic acid; dietary intakes of about 20 mg. a day are quite common; and, being without citrus fruits, our main dietary sources are potatoes and cooked vegetables. There is also some evidence of deficiency of vitamin A, iron, and calcium, and possibly of animal protein and of fat; but there is little or no evidence of deficiency of total protein, thiamin, or riboflavin. We see much gingivitis and follicular hyperkeratosis, and a great deal of dental caries; but there is very little corneal vascularization of the type described by Sydenstricker. We have work in hand to try to interpret some of these difficult and doubtful signs. As Sir Wilson Jameson told you two years ago: "For a beleagured citadel we are being very well fed indeed," but "the margin of safety we possess must be very small." It has therefore been, and continues to be, important to watch that margin and to seek the earliest signs of malnutrition by carrying out reliable nutritional surveys.

COMMENT ON METHODS

I said that we have been testing all methods, and I might now add a few words about these, although much more work is needed to evaluate them. It is deceptively easy to use a method; it is surprisingly difficult to draw justifiable conclusions. It is worth remembering that a scientist's facts are usually right; his interpretations of those facts are usually wrong.

The sequence of events in the production of deficiency disease points the way to the four groups of methods that are available. Over a period of time a person eats food deficient in a nutrient, and that fact may be detected by dietary methods. Then the concentration of that nutrient may become diminished in the blood or tissues of the body, and that may be detected by biochemical analyses of blood, tissues, or urine. Later the function of the cells that are most dependent upon the nutrient may become deranged, and that may be detected by certain functional tests such as a measure of the dark-adaptation of the subject, or of the ability to appreciate vibratory sensation. Last, the structure of cells is deranged, and the anatomical changes that result may be detected by clinical methods. Therefore the tools of the dietist, biochemist, physiologist, and clinician are all involved.

I do not wish to go into details of these methods, but I may be allowed to make a few passing comments. Dietary surveys have been valuable in the past for providing evidence about food consumption habits and in assisting the planning of educational programs. But they are laborious, costly, and far more inaccurate than is usually supposed: errors come in at all stages of collection and calculation of the data. Then it is customary to interpret consumption of a nutrient in terms of the supposed human requirements, and our knowledge of these comes at present partly from guess-work and the guesses have not always been very inspired. And there are probably many factors, such as the interrelation between nutrients, that alter requirements and are at present unknown to us. When we have much more accurate knowledge of food composition, of human requirements, and the factors affecting them, dietary surveys may by themselves provide evidence of the extent of malnutrition. They do not at present.

Biochemical methods show great promise, and a number of different estimations can be done upon a small quantity of blood. But the difficulties of most of the methods of analysis are insufficiently appreciated. I have recently seen in the course of a survey

in this country blood drawn and routinely stood at room temperature for upward of 4 hours before the plasma was separated and treated for the estimation of ascorbic acid; great losses might have occurred. Hemoglobin, serum protein, blood (or plasma) ascorbic acid, serum phosphatase and vitamin A are particularly valuable. The first three are routinely included in our mobile surveys, and have been done on blood obtained by a finger-prick in a large survey of children. We have also recently been working on a micro-method for serum phosphatase. But the interpretation of blood analyses is a matter of very great difficulty.

We frequently find low plasma values for ascorbic acid: in the late summer and winter of 1941–1942, 76 per cent of the members of a sample of working class families in Oxford had values below 0.1 mg. per 100 ml. plasma. These values are taken by many biochemists to indicate scurvy, yet I know of no evidence that shows such values are incompatible with full health. In our main survey we have routinely estimated ascorbic acid in the leucocyte-platelet layer of blood since it is probable that this value falls to zero about the time that clinical signs of scurvy begin to develop, whereas a plasma value of zero has not been proved to indicate ill-health.

We perform several other estimations upon blood (such as riboflavin and thiamin), but none of these has yet proved practicable and valuable for rapid public health purposes at the present time. However, the estimation of all water-soluble vitamins in the leucocytes is a technic that may prove extremely valuable for detailed nutritional surveys; certain of them, such as niacin and riboflavin, can be present during clinical deficiency in blood in normal concentration but are low in tissues, and the leucocytes afford a convenient tissue to obtain in surveys. I know of no analysis of urine that can provide useful information about the state of nutrition in rapid surveys for public health purposes.

Tests of function are disappointing. Dynanometers, spirometers, and the like have had their day, and are now usually relegated to the attic. I still believe in the value of the dark-adaptometer, provided the machine and its operator are reliable and that only poor night-vision that improves significantly upon therapy with vitamin A is taken as a criterion of deficiency of that nutrient; such deficiency is not the commonest cause of poor night-vision in England, but it occurs, and can undoubtedly be diagnosed earlier by this means than by any other.

A clinical examination including biomicroscopy, a medical history, and a dietary history are absolutely essential in any proper nutritional survey. Unfortunately, however, the early clinical signs and symptoms of nutritional deficiency are almost without exception nonspecific; and the slit-lamp microscope is a tool that should only be found in trained and skillful hands, and even then it has not yet revealed any sign that has been proved to be specific. Photography is coming to be used widely in nutritional surveys, and it gives a useful objective record of certain findings; but I emphatically believe that it cannot yet replace an examination by a clinician. X-ray determinations of bone density are promising in the hands of experts; but estimates of capillary fragility, and all anthropometric determinations and indices (except height and weight) are of no proved value. The tools that the medical nutritionist can offer—or should offer—to the public health officer are therefore few. We need more.

TODAY'S DILEMMA IN NUTRITION

The great surgeon and philosopher, Wilfred Trotter, used to call attention

to the lamentable lag between scientific discovery and its application to public health, citing in particular Lind's clear demonstration of the method of preventing scurvy, and its adoption by the Royal Navy after nearly half a century and by the Mercantile Marine after 150 years. That lag still exists, but there is also a lamentable alacrity with which nutritional knowledge or nutritional guesses, derived almost entirely from work on lower animals, are applied to man. Perhaps the reason is obvious. On the one hand, the classical work of Sir Robert McCarrison, Sir John Orr, and others has abundantly demonstrated the tremendous effects of adequate diets and proper nutrition in maintaining sound health; and we know that malnutrition is widespread in many parts of the world although we are extremely ignorant of its precise epidemiology. On the other hand, the science of nutrition has made very rapid progress in the last few years, particularly regarding our knowledge of the nutrition of lower animals. Many have been anxious to apply that animal work to man; and fed by inadequate evidence a fire of uncritical enthusiasm to detect and treat imagined deficiencies has swept our countries, its flames fanned by certain political and vested interests, and when the scientists have left their laboratories they have not always lent a hand at the fire-engine.

Many useless surveys are being made; and many surveys are harmful because unjustified interpretations are put upon the results obtained. There is chaos in this field in both our countries, but it is not coördination that is needed: coördination has been cynically defined as the process of converting disorganized chaos into regimented confusion. We need more scientific knowledge.

THE NEED FOR ADDITIONAL RESEARCH

Since a knowledge of the incidence, severity, cause, and distribution of malnutrition is so important for public health, we must add to the few methods we already possess of eliciting that knowledge. Such knowledge is even more important in war than in peace, and it will be particularly needed as soon as parts of occupied Europe become liberated, when rapid nutritional surveys should immediately be made to discover the epidemiology of the malnutrition so that proper and adequate relief steps can quickly be taken and secondarily so that observations of nutritional deficiency in man can be made under conditions that should never occur again. Further, the United Nations at Hot Springs were pledged to make food consumption surveys and nutritional surveys after the war. To what source will they turn for advice in that important and integrated task? We have now only a few of the necessary tools, but others are almost within our grasp.

Since our emphasis must be on health in man, rather than on isolated abstractions culled from work on lower animals, we must learn more about the earliest methods of detecting departures from health due to nutritional deficiencies. That can only be done by experiments upon man. Centuries ago work on human nutrition was done by Sanctorio, and by William Stark who twice induced scurvy experimentally in himself and died of it in 1770 at the age of 29.

That work largely failed because the time was not ripe. But such work can and should now be undertaken on an adequate scale. We in Oxford have been studying such induced deficiency in man, using medical students, theological students, conscientious objectors, and ourselves. But no group in this country or in England has fully adequate facilities for properly carrying out such important experimental work.

NUTRITION AND PUBLIC HEALTH

Exactly 200 years ago Lavoisier, the founder of the science of nutrition and a public spirited man, was born. The time has now come to take stock of that science in so far as it affects public health, and it is perhaps the medical nutritionists, rather than the agriculturists or home economists, who should do so. For nutrition is one of the most important fields of public health, and agricultural policy must be guided by the nutritional needs of the people, which in turn are revealed by nutritional surveys controlled by research on human nutrition. And education, for which the home economists have done such excellent work, is an essential part of a national nutrition program and cannot be divorced from the broad field: a nutritional survey itself helps to interest people in what they should eat so that they will obtain their vitamins from their garden or grocery store, and not from their drugstore.

The public health field of human nutrition, then, is a broad one, and needs full coöperation among physicians, biochemists, home economists, and agriculturists. In England I hope we shall see a division of nutrition in the Ministry of Health working in collaboration with a department of human nutrition in a university, the latter carrying out research and applying it to nutritional surveys throughout the country — and perhaps clinical deficiency states will be included in the notifiable diseases. Then food policy will be guided by sound advice that springs from knowledge, experience, and scientific research directly and critically applied; and rapid advances will be made in what is perhaps the most important field in the domain of human welfare.

Staphylococcus and Streptococcus Carriers*

Sources of Food-borne Outbreaks in War Industry

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WHEREAS enteric infections form the principal type[1] of food-borne disease prevalent in Continental Europe, in the United States staphylococcal food poisoning[2] is probably the most common of all food-borne diseases. Since this disease is not reportable, we have no accurate knowledge as to the actual number of cases occurring annually. The control of food-borne disease is not only the concern of the epidemiologist[3] and of the public health officials, but also of every physician, food handler, and citizen, especially now that we are engaged in total war.

Gastrointestinal diseases are a major cause of absenteeism in industry. McGee and Creger[4] determined that 18.6 per cent of 40,942 days lost by employees of a Hercules Powder Company plant in New Jersey in 1941 were due to gastrointestinal disturbances. Of 5,402 absences from work, 24 per cent were due to this group of diseases. Of the 7,605 days lost from diseases of the digestive tract, 30.6 per cent were from gastrointestinal upsets and colon dysfunction, and 4.1 per cent from enteritis and dysentery. Most of the absenteeism from these causes occurred after week-ends and after holidays. We, ourselves, have repeatedly observed food poisoning disrupt a large war plant.

The health officer, the industrial physician, the industrial manager, the food handler, and the consumer himself play important rôles in controlling food-borne disease. Health officers are anticipating an increase in food-borne disease from public eating places and industrial cafeterias as a direct result of the war. More people are eating in restaurants because of the rationing of food and because of the placing of women in industry. There are increasing difficulties encountered in these restaurants. The lack of responsible personnel, trained in the sanitary and proper handling of food, the overburdening of the kitchen facilities, the unavailability of proper equipment, and, in some instances, the short cuts and improper processing of foods are the principal causes for the increase in food-borne disease. Horwood and Pesare[5] made sanitary surveys of public eating places in Rhode Island and concluded: "Ignorance of accepted

* Presented at a Joint Session of the Epidemiology, Health Officers, Maternal and Child Health, and Laboratory Sections of the American Public Health Association at the Seventy-second Annual Meeting in New York, N. Y., October 14, 1943.

sanitary requirements and procedures as manifested by the managers and employees of public eating and drinking establishments appeared to be the most important single cause of insanitary practices in such places."

In the investigation of any suspected food-borne outbreak, an analysis of the symptoms will often give the epidemiologist a clue as to the etiological agent. The enterotoxin of *Staphylococcus aureus* produces symptoms in 2 to 6 hours. Whereas fever is a common symptom of food-borne infections it is not a frequent finding in staphylococcus enterotoxin poison. Nausea, vomiting, abdominal cramps or pain and diarrhea leading to prostration are the usual rapid sequence in severe staphylococcal poisoning; chills, sweats, and toxemia are other frequent findings. The onset is more acute than in Salmonella infections, the duration is usually a matter of hours and recovery is rapid. In Salmonella infections, on the other hand, recovery is a matter of days.

In several instances, green-producing streptococci have been incriminated as the source of food-borne outbreaks. Linden, Turner, and Thom [6] reported two such outbreaks in both of which cheese was found to be the vehicle. *Streptococcus lactis* [7] when isolated from this food and fed to kittens produced symptoms similar to those caused by staphylococcus enterotoxin. Carey, Dack, and Meyers [8] isolated alpha-streptococci from canned sausages in an outbreak involving 75 persons. Living cultures of this organism fed to volunteers produced a syndrome clinically indistinguishable from staphylococcal food poisoning. Bacteria-free filtrates were non-toxic. Similar results were obtained by Carey, Dack, and Davison [9] in another outbreak caused by this organism. There is, therefore, some evidence that green-producing streptococci may cause gastroenteritis in man. However, unlike staphylococcal food poisoning, the toxic material is not contained in bacteria-free filtrates of this organism.

The clinical picture presented by this type of food infection resembles that of staphylococcal poisoning very closely. A differentiating feature is the longer incubation period found in outbreaks caused by green-producing streptococci. This usually varies from 5 to 18 hours, with an average of about 12 hours.

DEMONSTRATION OF THE ETIOLOGICAL AGENTS

The application of bacteriological procedures to the study of food poisoning must take account of the diverse etiological agents encountered in these outbreaks. Epidemiological and clinical data may suggest the identity of the causative agent as in botulism but are of less value in differentiating between the more common agents of food poisoning. Assuming the special technics necessary for the isolation and identification of the Clostridiae to be indicated or excluded clinically, the bacteriologist must provide technics adequate for the isolation and identification of: (1) staphylococci, (2) streptococci, (3) the enteric group. Staphylococci and streptococci were encountered in the outbreaks reported here. Members of the enteric disease group were excluded as possible causes by appropriate clinical and bacteriological examinations.

Nose, throat, and stool cultures were taken on all suspected food handlers. Swabs were cultured on 5 per cent horse blood agar and in beef infusion broth for 24 and 48 hours. Stool specimens were cultured on differential media for members of the enteric disease group.

Adequate epidemiological investigation usually reduces the number of foods suspected in a given outbreak. The foods thought to be responsible were brought to the laboratory im-

mediately or packed in dry ice for shipment.* Representative samples of each food were cultured in beef infusion broth on 5 per cent horse blood agar and differential media for the enteric disease group. Since chromogenesis varies with different media and cultural conditions, the differentiation of all staphylococci was made on the basis of pigment production on beef infusion agar incubated 24 hours at 37.5° C. No detailed study of colony variants was attempted.

The streptococci were classified according to the group-precipitation test described by Lancefield.[10] The serological type of Group A strains was determined by the slide-agglutination technic reported by Griffith.[11]

Casein hydrolysate filtrates were prepared according to the method of Favorite and Hammon.† [12] Filtrates were tested for enterotoxin by feeding to kittens and by the intravenous kitten test described by Hammon.‡ [13] Diarrhea and vomiting in 1 to 3 hours following administration of the filtrate was interpreted as a positive reaction.

The results of these toxigenic studies are summarized in Table 1. Unlike *Staphylococcus aureus*, the streptococci studied failed to produce an enterotoxic substance in casein hydrolysate but did produce a toxic substance in sterile tissue media which when administered intravenously to kittens induced an enterotoxic reaction. These substances could be readily distinguished from staphylococcus enterotoxin in that they were non-toxic by mouth. A detailed study of these tissue media filtrates has been reported by Foley, *et al.*[14] As has been the experience of others,[8, 15] whole cultures of streptococci produced enterotoxic reactions when fed to kittens.

There are conflicting reports as to the value of the various biochemical technics devised to distinguish enterotoxic strains.[16, 17] The "potential" enterotoxicity as judged by procedures other than the kitten test does not appear to be sufficient evidence to incriminate either a food or food handler as the source of illness.

Certain biochemical characteristics of the enterotoxic staphylococci isolated from foods and food handlers involved in these outbreaks are summarized in Table 1. Such tests are of some value in establishing the probable identity of strains but do not indicate enterotoxicity. There appears to be a rough correlation between alpha-hemotoxin titer and enterotoxicity as observed by Woolpert and Dack [18] but exceptions were noted.

ANALYSIS OF OUTBREAKS

It is well known that the staphylococcus and the streptococcus are ubiquitous in their distribution. They are found in the nose and throat of healthy persons where they become quite abundant during upper respiratory infections. They are readily isolated from superficial skin lesions and from routine air samples. In spite of modern aseptic surgical technics, they are often incriminated as the cause of postoperative stitch abscesses. It is, therefore not surprising that foods are often contaminated by them.

Our experience with staphylococcal food poisoning has demonstrated that it is by no means infrequent. The few outbreaks coming to the attention of public health authorities represent but a fraction of the actual number. Very often only the most dramatic incidents

* After bacteriological examination, samples were homogenized in a Waring Blender, mixed with milk or fish, and fed to kittens (4–6 months old) which had been starved the previous 24 hours. Typical "enterotoxic" reactions could be produced with contaminated foods by this method.

† In our experience, rotation was not essential to the production of an enterotoxin satisfactory for routine tests.

‡ Results of feeding experiments with original foods and casein hydrolysate filtrates agreed with those of the intravenous test with filtrates of the same strain.

TABLE 1

Summary of Epidemiological and Bacteriological Data, 18 Outbreaks, Food Poisoning

Out-break	Microörganism	Source	Fermentation of: Trehalose	Sorbite	Lactose	Mannite	Salicin	Enterotoxin	Alpha Hemo-toxin Titer	No. Ex-posed	No. Ill	Attack Rate
1	*Staph. aureus*	Food Handler	+	−	+	+	+	+	0.008	200	58	29.0
	"	"	+	−	+	+	+	+	0.008			
	"	"	+	+	+	+	+	+	0.008			
	"	Potato Salad	+	−	+	+	+	+	0.008			
	"	Ice Cream	+	+	+	+	+	+	0 008			
2	*Staph. aureus*	Food Handler	+	−	+	+	+	+	0 031 [1]	211	1.9	66.0
	"	Egg Salad	+	−	+	+	+	+	0 016 [1]			
3	*Staph. aureus*	Food Handler	+	+	+	±	+	+	0.125	Unknown	2+	Unknown
	"	Cream Filling	+	+	+	±	+	+	0.125			
4	*Staph. aureus*	Food Handler	+	+	+	±	+	+	0.125 [2]	Unknown	9+	Unknown
	"	Cream Filling	+	+	+	±	+	+	0.125 [2]			
5	*Staph. aureus*	Food Handler	+	+	+	+	+	+	0.125	2	2	100.0
	"	"Scotch" Ham	+	+	+	+	+	+	0.125			
6	*Staph. aureus*	Food Handler	+	+	+	+	+	+	0.004	800	180	22.2
	"	Boiled Ham	+	+	+	+	+	+	0.004			
7	*Staph. aureus*	Food Handler	+	+	+	±	+	+	0.008	Unknown	30	Unknown
	"	Corned Beef	+	+	+	±	+	+	0.008			
8	*Staph. aureus*	Food Handler	+	+	+	−	+	+	0.031	52	48	92.3
	"	Salad Dressing	+	+	+	−	+	+	0.031			
9	*Staph. aureus*	Food Handler	+	+	+	+	+	+	0.008	40	28	70.0
	"	Boiled Ham	+	+	+	+	+	+	0.008			
10	*Staph. aureus*	Food Handler	+	+	+	+	+	+	0.031 [1]	Unknown	60	Unknown
	"	Custard Pie	+	+	+	+	+	+	0.063 [1]			
11	*Staph. aureus*	Noodle Soup †	+	+	+	±	+	+	0.016	2	2	100.0
12	*Staph. aureus*	Boiled Ham Sand.†	+	+	+	−	+	+	0.008	70	17	24.3
13	*Staph. aureus*	Roast Turkey †	+	+	+	+	+	+	0.031	17	17	100.0
14	*Staph. aureus*	Boiled Ham †	+	+	+	+	+	+	0.008	3	3	100.0
15	* Beta Hemolytic Strep., Group A, Griffith Type 2	Food Handler	+	−	+	+	+	−− [3]		182	102	56.0
		Boiled Ham	+	−	+	+	+	− [3]				
16	* Alpha Strep. Lancefield, Group B	Food Handler	−	+	−	−	−	− [3]		Unknown	18	Unknown
		Cream Chicken	−	+	−	−−	−	− [3]				
17	* Alpha Strep. Lancefield, Group H	Food Handler	+	+	+	+	+	− [3]		6	6	100.0
		Baked Beans	+	+	+	+	+	− [3]				
18	* Alpha Strep. Lancefield, Group B	Chop Suey †	−	+	+	−	+	− [3]		3	3	100.0

[1] Difference of 1 tube in titration

[2] Weak Enterotoxin, in casein hydrolysate media. (Checked through kindness of Dr. G. M. Dack, University of Chicago.) Toxicity enhanced by culture in cream filling

[3] Whole cultures and tissue media filtrates enterotoxic for kittens

* Present in pure culture

† Food handlers not cultured

are reported. Sometimes newspaper accounts of such epidemics serve as the first notice to the health officer that something has happened. About half of the outbreaks listed in this paper took place in a single community. The interest of the health officer in this problem was a major factor in bringing most of these to light. We must assume that although rarely reported, similar episodes are a constant occurrence.

Certain of these outbreaks are more apt to become manifest than others. Institutional outbreaks, or those coming after a large gathering where a single meal common to a considerable number of persons has been incriminated, are readily detected. However, in other instances in spite of large numbers of cases, relatively few are reported. Outbreak 10 (Table 1) illustrates this point. The epidemiological investigation revealed that an infected pastry product had been shipped to numerous restaurants and diners in many different communities. For the most part it was sold in individual helpings. Although hundreds of potentially infected pies were distributed, only 60 cases came to our attention. For the most part these consisted of multiple cases occurring among small groups of persons who had eaten together at a single restaurant. In such groups the common source could be established without too much difficulty. "Car sickness" was considered the cause of one patient's illness with symptoms so severe that hospitalization became necessary. A newspaper account of the outbreak eventually led to the association of this case with the epidemic. In individual cases it is often very difficult to pick out any single food as the cause of symptoms. This factor alone tends to obscure the source of many outbreaks and is a definite asset to dirty and poorly managed food dispensing establishments.

The storage of food is an important factor in the morbidity rate. The longer the infected food is kept in a warm place, the greater the attack rates. In each of the outbreaks reviewed here, the epidemiological investigation revealed that the food was kept warm for a period of several hours. Thus certain procedures of food preparation may be the means of incubating pathogenic organisms accidentally introduced.

It has been assumed at times that bacteria harbored in the nose and throat of food handlers may be responsible for staphylococcal and streptococcal food-borne disease. Roberts and Wilson [19] in the study of one outbreak attempted to show that a strain of staphylococcus cultured from infected pastry was the same as that recovered from a food handler. Repeated cultures of this person revealed the same strain for a period of 4 months. Identical organisms were recovered from other food handlers in the bakery.

Our study demonstrates that staphylococcal food poisoning outbreaks may be traced to specific food handlers as sources of infection. In each instance where it was possible to culture the nose and throat of persons responsible for the preparation of an incriminated product, an apparently identical strain of *Staphylococcus aureus* was recovered from at least one of the food handlers and the infected food (Table 1). Although staphylococci are a universal contaminant of the environment, those strains harbored in the nose and throat of the food handler are invariably associated with outbreaks.

Figures collected from several sources [19] showed that the incidence of staphylococcus in the nose and throat of the general population was quite high, ranging from 76.3 per cent to 86.1 per cent in several different samples. Apparently all of these

strains were not chromogenic and only a portion of them were hemolytic.

Utilizing the kitten tests, we compared the incidence of enterotoxin-producing strains of *Staphylococcus aureus* in the nose and throat of food handlers involved in food poisoning outbreaks with that of other food handlers. There was a significant statistical difference between the two groups. Eighteen per cent of a total of 122 in the incriminated group harbored enterotoxin-producing staphylococci, while only 3.4 per cent of the control group of 146 carried such organisms.

Our study suggests that staphylococcal food-borne outbreaks are associated with a high enterotoxin-producing staphylococcus carrier rate among the incriminated food handlers. In four outbreaks, the incriminated strain was recovered from more than one food handler of a particular group. In one outbreak 3 members of the cafeteria personnel in an industrial establishment were found harboring the same organism as that isolated from the incriminated food. Moreover, this appeared to be the identical strain which had been recovered in a previous outbreak 7 months before at this very plant. Another group of food handlers was cultured 5 months after the occurrence of a staphylococcal food poisoning outbreak. Enterotoxin-producing staphylococci were isolated from 3 of the 21 members of this group.

Three of the reported outbreaks were attributed to green-producing streptococci. In two of these, apparently identical strains were recovered both from the incriminated food and the nose and throat of food handlers. Alpha-streptococci of Group H (Lancefield) were involved in one, and of Group B (Lancefield) in two. In each instance, kittens were made ill by whole cultures of the respective streptococcus, but not by its filtrate. The incubation period both in patients and kittens was prolonged as compared with staphylococcal food poisoning.

Green-producing streptococci belonging to Group H are a common inhabitant of the nose and throat.[20] The distribution of this organism should be borne in mind in the diagnosis of obscure food-borne outbreaks where the incubation period is somewhat longer than that of the staphylococcal outbreak and where no other bacterial or toxic agent is demonstrable. Alpha-streptococci of Group B are less frequently encountered[21] in routine nose and throat cultures. To our knowledge, these three outbreaks are the first reported food-borne epidemics produced by alpha-streptococci classified according to group-precipitation tests (Lancefield).

Outbreak 15 is of unusual interest. A beta-hemolytic streptococcus (Group A, Griffith Type 2) was established as the causative organism. The outbreak consisted of 24 cases of scarlet fever, 56 cases of septic sore throat, 7 cases of diarrhea, 7 cases of nausea and vomiting, and 8 cases of miscellaneous complaints. Gastrointestinal symptoms were unusually prevalent in all the patients. The identical strain of streptococcus was isolated from the throat of the responsible food handler, from the ground ham, and from the throats of several patients. Animal experiments and other laboratory procedures suggest that an enterotoxic substance may have been responsible for the unusually large incidence of nausea, vomiting, and diarrhea. Detailed descriptions of this outbreak and laboratory procedures are contained in other published reports.[14, 22]

Although three different groups of bacteria were involved in these eighteen food-borne outbreaks, carriers of a specific organism were the apparent source of infection in thirteen. In the five remaining outbreaks, food handling personnel were not cultured.

PREVENTION

One of the most effective methods of reducing food-borne diseases is the enforcement of proper personal hygiene practices by all food handlers. Keeping the hands away from the mouth and nose, covering the mouth with a handkerchief while coughing or sneezing, followed by washing the hands, covering foods whenever possible, refrigerating those that are perishable, reducing the interval between cooking and eating, eliminating food handlers with purulent wounds, boils, or infections of the hand, preventing food handlers with sore throats from preparing food—all these will reduce most of the instances whereby staphylococci and streptococci may contaminate food. One of the methods for controlling the ubiquitous staphylococcus in cream or cream-filled pastries is the rebaking of these delicacies as described by Stritar, Jungewaelter, and Dack.[23]

SUMMARY

Food-borne outbreaks in war plants may become an ever increasing cause of absenteeism among workers. Health officers, industrial physicians, and cafeteria managers working coöperatively may accomplish a great deal toward the prevention of food poisoning.

It must be borne in mind that although staphylococci and streptococci are found everywhere in the environment, food handlers carrying such organisms in the nose and throat are almost invariably responsible for food-borne outbreaks. In thirteen out of eighteen outbreaks reviewed in this paper, apparently identical organisms were recovered from incriminated food and the nose and throat of food handlers.

It is suggested that staphylococcal food-borne outbreaks are associated with a high enterotoxin-producing staphylococcus carrier rate among the incriminated food handlers.

Three of the outbreaks were produced by alpha-streptococci, the responsible organism in each instance having been classified according to group precipitation tests (Lancefield). One outbreak had as its etiological agent beta-hemolytic streptococci (Group A—Griffith Type 2).

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California Acts on Cheese-borne Typhoid Fever

According to a report recently released by Wilton L. Halverson, M.D., Dr.P.H., Director of Public Health of the State of California, approximately 76 cases of typhoid fever, all of Type C, have occurred in California during the period between April 9 and May 26. Seventy of these cases occurred in four counties, namely, Kern, Tulare, San Benito, and Monterey. Four additional cases have been reported from Nevada.

In view of the fact that all cases were of the same type and since all occurred during the same approximate time interval, it was assumed that the outbreak was from one source rather than from multiple sources.

Epidemiological investigation elicited the information that in various areas cases tended to trade at certain grocery stores. This was especially true in Bakersfield, where practically all of the 20 cases traded at one store.

The investigation elicited the information that the common factor was the ingestion of unripened, unpasteurized cheese of the Romano Dolce type, a type of cheese recently developed in California. When it became evident that well over 90 per cent of all the cases had ingested this type of cheese, a conference was called with representatives of the dairy industry, the University of California, the State Department of Agriculture, and the State Department of Public Health.

According to Dr. Halverson, after the data had been canvassed all concerned agreed that the evidence at hand called for immediate action, namely, the impounding of all cheese of this type as well as companion types manufactured in the same factories. To this end, action was immediately taken by the State Department of Agriculture, the regulatory agency for dairy products. An intensive investigation of the cheese factories producing cheese distributed in the areas concerned began. Because of complex and overlapping distribution systems, it was not possible to incriminate any single factory.

The previous call for an extraordinary session of the State Legislature for another purpose gave an opportunity to secure legislation to prevent a repetition. The Director of Health requested Governor Earl Warren to request in a supplementary call legislation which would correct this situation. The Governor immediately saw the importance of setting up safeguards to prevent a recurrence and as a result legislation was prepared, has been passed by both houses, and signed by the Governor, which provides that all cheese sold in the State of California must be pasteurized, must be made of pasteurized milk, or must be ripened or cured for a period of not less than 60 days. The bill also provides for proper labeling of the product whether manufactured in or out of the state, and contains an urgency clause which makes it effective immediately.

The short interval of time between the discovery of the cases and the cooperative action on the part of the State Departments of Agriculture and Public Health and the immediate action of the Legislature are notable.

Salmonellosis as a Public Health Problem in Wartime*

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UNDER war conditions, the control of diarrheal diseases, which are a constant threat to the health of our armed forces, industrial workers, and other civilians, is one of the problems demanding increasing attention by health departments. Overcrowding in rapidly expanding industrial centers, an ever-growing shortage of labor and a constantly shifting population, are some of the many factors operating in a wartime environment, which tend to increase the incidence of these infections.

The problem of controlling Salmonella infections is at best an exceedingly difficult one. There is complete lack of uniformity among the various states as to administrative practices concerning these diseases. In many areas, where Salmonellosis is not reportable, except for supervision of outbreaks no cognizance is taken of sporadic infections. On the other extreme, restrictions imposed by health authorities are sometimes excessively severe. One state requires that any person excreting paratyphoid organisms, but apparently well, shall be considered a carrier and kept under observation for one year even though repeated stool cultures are negative.[1] In one Army jurisdiction,[2] food handlers whose stool cultures are found to be positive on routine examination are hospitalized.

Such lack of unanimity is a direct result of the many unsettled problems concerning the epidemiological and clinical implications of Salmonella infections. If it were realized that permanent carriers, except of *Salmonella paratyphi B*, are not frequently discovered as sources of infection, much time would be saved in investigations. Because of the possibility of animal sources for cases occurring in man, human sources have often been ignored. Because some paratyphoid cases are very mild, it has been felt that, except in infants and the aged, these infections are inconsequential and merit no great amount of attention. The complexity of the problem is aggravated by the steadily increasing number of newly discovered Salmonella types.

The epidemiological investigations of sporadic Salmonella infections are by no means simple procedures. Table 1 lists the 22 types of Salmonella organisms recovered in Massachusetts since 1937, together with their possible hosts as recorded in the literature. It is apparent that these organisms have been isolated from many animals and that they are widespread among domestic and wild birds.

* Presented at a Joint Session of the Epidemiology, Health Officers, Maternal and Child Health, and Laboratory Sections of the American Public Health Association at the Seventy-second Annual Meeting in New York, N. Y., October 14, 1943.

TABLE 1

Previously Recorded Hosts of Salmonella Found in Massachusetts

Group	Type	Occurrence in Animals or Birds	Occurrence in Man: Disease	Occurrence in Man: Carriers
B	*S. paratyphi B*	(3) Chickens (3,4,5) hogs (3,6) cows	3	3
B	*S. typhimurium*	Many species of birds, animals	3	3
B	*S. chester*	(4,7) Hogs	3,7	20
B	*S. derby*	(3,4,8.9,10) Poultry (3) ruminants (4,5,6,11) hogs (12) meat	3	3,20
B	*S. bredeney*	(3,4,8,10) Poultry (3) ruminants (4,5,11) hogs (12) meat	3	3
C	*S. newport*	(3,9,10,13) Poultry (3) rodents (3,8) ruminants (5) hogs (15) fox	3,21	3,20
C	*S. oranienburg*	(3,4,8,9,10) Poultry (10) quail (13) birds	14,3	22,3
C	*S. montevideo*	(3,8,10) Poultry (3) carnivores (4) hogs	3,14	3
C	*S. cholerae suis*	(3) Poultry (15) foxes (5,11,16) hogs	3	..
C	*S. bareilly*	(3,4,8,9,10,14) Poultry (3) carnivores (4,11) hogs	3,14,21,23	3
C	*S. muenchen*	(3,8,10) Poultry (7) guinea pigs (5) hogs	7,21	20
C	*S. manhattan*	(3,17) Poultry (3) hogs	17,3	17,3
C	*S. tennessee*		..	3
D	*S. panama*	(3) Poultry (3) hogs	3,22	20,22
D	*S. enteritidis*	(3,8,9,13,16) Poultry (3) rodents (13) horses (13) cattle	3	..
E	*S. anatum*	(3,4,8,9,10,13,16) Poultry (16) ducks (3) rodents (5,11) hogs (18) dogs	3	3
E	*S. give*	(3,4,8) Poultry (11) hogs (12) pork liver	3	3
E	*S. senftenberg*	(3,8,10) Poultry (3) hogs (12) meat	3,17	3,17
E	*S. newington*	(3,4,8,9,10) Poultry (3) rodents (11) hogs (15) fox	3,17	3,17
Other	*S. kentucky*	(3,8,9,10) Poultry (10) pheasants (19) camels	3,17	..
Other	*S. worthington*	(3,4,8,10,17) Poultry (11) hogs	3,17	3,17
Other	*S. urbana*	(3) Poultry (3) Swine	17	17

Since outbreaks have been traced to infected meat, there is some likelihood that sporadic cases may arise from a similar source. Salmonella-infected horsemeat has been incriminated in several epidemics reported from Germany.[24] It is possible that the increased consumption of horsemeat in this country may present us with an additional source of infection. *S. muenster*[25] has been recovered from a person who developed food poisoning after eating raw horsemeat. Although, in general, meat incriminated in outbreaks has been traced to diseased carcasses, recent investigation[12] has revealed the presence of Salmonella organisms in the meat and organs of apparently healthy animals. Pork and pork products were more frequently infected than other meats.

Eggs belonging to several species of

birds have been occasionally established as sources of infection. Adult ducks and duck eggs [13] harbor several varieties of Salmonella organisms. It has been demonstrated [26] that *S. typhimurium* can penetrate the shell of duck eggs. Pigeon and goose eggs used in the preparation of puddings and salads have also been incriminated.[27, 28] *S. senftenberg* was isolated from a commercial egg preparation during the investigation of an epidemic in Massachusetts caused by *S. paratyphi B.*

Rats and mice may transmit Salmonella infection.[29] Surveys have demonstrated that wild rats harbor these organisms.[30] The house fly [31] and the mosquito (*Culex pipiens*) [32] may serve as additional vectors. Quite recently it was demonstrated that *S. enteritidis* may be transmitted experimentally by the Rocky Mountain wood tick *Dermacentor andersoni*.[33]

The multiplicity of sources and vectors is a troublesome factor in tracing sporadic cases. Such investigations are time consuming and, if a large proportion of these infections originate from animal sources, the prospect of successful control is not particularly bright.

PURPOSE AND METHODS

In 1937, during the investigation of several Salmonella outbreaks, the frequent occurrence of inapparent infection among those exposed to the causative agent was an interesting observation. In spite of detailed study, the sources of these outbreaks remained unknown. No direct association could be seen with either permanent carriers or animal sources. Subsequently, subclinical infection was often noted among the contacts of sporadic cases. One would scarcely postulate animal sources for Salmonella infections of formula-fed infants in immediate contact only with hospital personnel. The primary purpose of this study was, therefore, to evaluate the rôle of both unrecognized and inapparent infection in the transmission of salmonellosis.

Salmonella infection was declared a notifiable disease. All reported cases were investigated epidemiologically. Wherever possible, stool examinations were performed at suitable intervals in order to determine the total period of infectivity. Contacts were studied for evidence of either clinical or subclinical disease. All positive cultures were typed * and classified according to the Kauffmann-White schema.[34, 35] Clinical data were collected in order to acquire further information concerning the nature and severity of these diseases.

ANALYSIS OF FINDINGS

A. Epidemics

Table 2 summarizes our experience with Salmonella infections in Massachusetts since 1937. As one might expect, the number of epidemic cases varies considerably from year to year. Sporadic infections remain, on the other hand, at a fairly constant level. The increase noted during 1942 and the first 6 months of 1943 is due per-

TABLE 2

Salmonella Infections in Massachusetts

Year	*Total Epidemic Cases*	*Total Sporadic Infections*	*Positive Routine Specimens*	*Total*
1937	228	53	0	281
1938	16	68	3	87
1939	5	31	4	40
1940	73	60	13	146
1941	8	60	9	77
1942	26	90	12	128
1943 *	0	46	6	52
	356	408	47	811

* January to July, 1943

* Original isolations were made by the Bacteriological Laboratory of the Massachusetts Department of Public Health, and typing was performed by the Laboratory of the Department of Bacteriology and Serology of the Beth Israel Hospital, New York, N. Y., under the direction of Dr. Erich Seligmann.

haps to a greater interest on the part of physicians in these diseases. It is apparent that a rather extensive reservoir of Salmonella infection exists in our population.

Epidemics have been caused by seven varieties of Salmonella organisms (Table 3). *S. newington* and *S. senftenberg*, although not often the cause of clinical disease in humans, were each involved in a single small outbreak. Eleven of these incidents were food-borne and, with the exception of one epidemic in a neighboring state (two Massachusetts residents infected with *S. derby*),[36] all our food-borne epidemics were due either to *S. typhimurium* or *S. paratyphi B*.

Of the institutional outbreaks, three (one *S. typhimurium*, one *S. newington*, and one *S. cholerae suis*) occurred among the new-born of three hospital nurseries. In one of these, the infection was traced to a mother with a previously unrecognized Salmonella infection who shortly after delivery had infected her newly-born infant. The disease then spread to other infants in the hospital nursery. Further investigation in the mother's household revealed that the maid, a second unrecognized case, had initiated this chain of cases which resulted eventually in the death of one infant. There was one fatality in each of the three nursery outbreaks.

Not included in Table 3 is a "subclinical epidemic" of seven *S. montevideo* infections which were discovered in an institution where release cultures were being taken following an outbreak of Sonne dysentery. Not one of these persons manifested symptoms compatible with Salmonella disease.

B. Sporadic Infections

The investigation of 295 sporadic cases (Table 4) resulted in the discovery of 113 additional infections among the contacts, an increase of 38.3 per cent. Forty-six of these (41 per cent) were clinical cases while 67 (59 per cent) were subclinical. It is significant that the follow-up of 14 *S. paratyphi B* cases, 90 *S. typhimurium* cases, and 23 *S. newport* cases yielded respectively 27, 30, and 10 new infections among the contacts.

TABLE 3

Salmonella Outbreaks in Massachusetts 1937–1943 *

Salmonella Types	*No. of Cases*	*Remarks*
	A. *Food-borne Epidemics*	
S. paratyphi B	129	Infected bakery product
"	63	School lunch
S. typhimurium	29	School party
"	6	Dinner party
"	12	" "
"	31	School party
"	9	Dinner party
"	4	" "
"	15	Picnic
S. derby	2	Dinner party
Untyped	4	Picnic
	B. *Contact Outbreaks (Institutional)*	
S. typhimurium	6	Hospital nursery
"	27	" building
S. montevideo	8	" ward
S. cholerae suis	4	" nursery
S. senftenberg	5	" ward
S. newington	2	" nursery
Total	356	

* January–July, 1943

TABLE 4

Salmonella Infections According to Type and Manner of Discovery

Type	Epidemic	Sporadic		Contacts to Sporadic Cases		Routine Specimens			Total
		No.	Per cent	Clinical	Subclinical	Release	Food Handler	Incidental	
S. paratyphi B	192	14	6.2	11	16	1	1	..	235
S. typhimurium	139	90	45.7	16	14	5	1	2	267
S. newport	..	23	11.8	5	5	..	1	1	35
S. oranienburg	..	13	6.7	2	5	6	2	..	28
S. anatum	..	7	3.5	..	1	2	..	..	10
S. montevideo	8	6	3.0	1	..	9	1	1	26
S. chester	..	1	0.5	..	..	..	1	..	2
S. give	..	2	1.0	..	..	..	..	..	2
S. panama	..	7	3.5	1	1	..	..	..	9
S. derby	2	7	3.5	..	3	2	..	1	15
S. cholerae suis	4	10	5.1	..	..	..	..	..	14
S. bareilly	..	4	2.0	..	1	..	1	1	7
S. kentucky	..	..	...	..	..	1	..	..	1
S. senftenberg	5	2	1.0	..	..	..	..	..	7
S. worthington	..	2	1.0	..	..	..	..	..	2
S. bredeney	..	1	0.5	..	..	..	..	..	1
S. enteritidis	..	2	1.0	..	2	..	..	..	4
S muenchen	..	3	1.5	..	1	..	..	..	4
S. urbana	..	3	1.5	1	1	..	..	..	5
S. manhattan	..	1	0.5	..	..	..	..	..	1
S. newington	2	..	...	..	..	..	..	..	2
S. tennessee	..	1	0.5	..	2	..	..	..	3
Not typed	4	96	...	9	15	4	2	1	131
	356	295	100.0	46	67	30	10	7	811

Studies among the immediate household contacts of 237 sporadic cases revealed multiple infections in 59, or 24.9 per cent. Two, 3, and 5 infected contacts were discovered respectively in 12, 4, and 6 families.

The relative frequency of the several Salmonella types as determined by the occurrence of sporadic cases is given in Table 4. *S. paratyphi B, S. typhimurium, S. newport,* and *S. oranienburg* are the most prevalent types. All together they represent approximately 70 per cent of all our typed sporadic cases. When arranged according to year of onset, it is observed that the same general pattern of prevalence is maintained each year. Except for *S. montevideo,* which is an occasional finding in routine examinations, these same four types are among those most commonly encountered when routine stool cultures are being taken for one reason or another.

It has been stated in the literature [37] that children are more susceptible to Salmonella infection than adults. When all types are combined, our figures would seem to confirm this opinion. About 29 per cent of all sporadic infections occurred in the first decade of life although each succeeding 10 year period up to age 50 contributed at least 12 per cent or more to the total number of cases. However, when consideration is given to differences in type, we find that in our sample unusual susceptibility in children up to age 10 was shown primarily when *S. typhimurium* was the etiological agent. The percentage of cases under age 10 among the four most frequently encountered types in the sporadic group was as follows: *S. typhimurium* 39.1 per cent, *S. paratyphi B* 24.4 per cent, *S. oranienburg* 20 per cent, and *S. newport* 18.2 per cent. If the *S. typhimurium* cases are excluded from the total sporadic group, the proportion of cases in the age group 0 to 10 drops from about 29 per cent to 23 per cent. Because of the small number of cases,

TABLE 5

Persistence of Salmonella Infections

Week	*S. paratyphi B*		*S. typhimurium*		*All Others*		*Totals*	
	No. of Cases Still Positive	*Percentage of Cases Still Positive*	*No. of Cases Still Positive*	*Percentage of Cases Still Positive*	*No. of Cases Still Positive*	*Percentage of Cases Still Positive*	*No. of Cases Still Positive*	*Percentage of Cases Still Positive*
1	203	100.0	239	100.0	268	100.0	710	100.0
2	203	100.0	214	89.5	255	95.0	672	94.6
3	168	90.7	155	65.0	198	73.9	521	73.4
4	125	61.5	102	42.7	156	58.0	383	42.7
5	93	45.8	62	26.0	114	42.5	269	37.9
6	75	36.9	48	20.1	96	35.8	219	30.8
7	55	27.1	41	17.5	77	28.7	173	24.4
8	44	21.6	31	12.9	56	20.8	131	18.5
9	33	16.3	25	10.4	42	15.7	100	14.1
10	23	11.3	22	9.2	37	13.8	82	11.6
20	17	8.3	11	4.6	13	4.8	41	5.7
30	13 *	6.4	8	3.3	8	3.0	29	4.1
40	13 *	6.4	8	3.3	7	2.6	28	3.9
50	11	5.4	6	2.5	6	2.2	23	3.2
60	10	4.9	3	1.3	4	1.5	17	2.1
67+	10	4.9	..	...	3	1.1	13	1.8

* Cholecystectomy was performed in one carrier at 30 weeks and one at 40.

no inference could be drawn regarding the more unusual types.

The distribution of the 295 sporadic cases according to the seasons of the year indicates that the highest incidence occurs in the summer and the lowest in the winter. The figures were as follows: spring 66, summer 116, fall 74, and winter 39. The cases were fairly evenly divided between the two sexes: 146 cases among males and 149 among females.

C. Laboratory Studies

1. *Persistence of Infectivity*—Infectivity of Salmonella cases persists for considerable periods of time. Table 5 summarizes the results of serial stool examinations in 710 (87.5 per cent) of our 811 cases. In the 4th week after onset of the disease, approximately 61 per cent of the *S. paratyphi B* cases, and 43 per cent of the *S. typhimurium* cases were still infectious. In the 8th week, the figures for *S. paratyphi B, S. typhimurium,* and all other types were 21.6 per cent, 12.9 per cent, and 20.8 per cent respectively. Excluding permanent carriers, 24 cases representing seven Salmonella types remained infectious for 6 months or longer. Seven of the 24 (1 *S. paratyphi B,* 5 *S. typhimurium,* and 1 *S. give*) continued to harbor the causative organism for at least one year and subsequently became negative.

There are many differences of opinion concerning the significance of positive stool cultures in healthy persons. Whether this condition is indicative of subclinical infection or merely temporary alimentary excretion is of some practical significance. Table 6 presents our findings concerning the persistence of positive stools in 123 cases of inapparent infection. Fifty-four per cent of these cases continued to excrete Salmonella organisms for 4 weeks, 22.8 per cent for 8 weeks, and 10.5 per cent for 12 weeks. The rate of decline in percentage of cases still positive each week approximates closely that noted for all Salmonella infections (Table 5). Seven of our permanent carriers presented no history of any illness suggesting clinical Salmonella disease and are therefore included in Table 6.

TABLE 6

Persistence of Subclinical Salmonella Infections

Week	*S. paratyphi B*		*S. typhimurium*		*All Others*		*Totals*	
	No. of Cases Still Positive	*Percentage of Cases Still Positive*	*No. of Cases Still Positive*	*Percentage of Cases Still Positive*	*No. of Cases Still Positive*	*Percentage of Cases Still Positive*	*No. of Cases Still Positive*	*Percentage of Cases Still Positive*
1	36	100.0	34	100.0	53	100.0	123	100.0
2	36	100.0	34	100.0	50	94.5	120	98.5
3	26	72.1	20	58.8	43	81.0	89	72.3
4	19	52.8	12	35.4	36	68.0	67	54.3
5	15	41.6	6	17.7	29	52.8	50	40.7
6	14	38.9	6	17.7	25	47.1	45	36.6
7	11	30.5	6	17.7	20	37.8	37	30.1
8	10	27.8	4	11.8	14	26.4	28	22.8
9	9	25.0	4	11.8	9	17.0	22	17.9
10	7	19.4	2	5.8	8	15.1	17	13.8
11	7	19.4	2	5.8	6	11.3	15	12.2
12	6	16.7	2	5.8	5	9.4	13	10.5
13	5	13.8	2	5.8	5	9.4	12	9.7
14	5	13.8	2	5.8	3	5.7	10	8.1
15	5	13.8	2	5.8	2	3.7	9	7.3
49	5	13.8	2	5.8	2	3.7	9	7.3
67+	5	13.8	..	...	2	3.7	7	5.7

Our studies show that age has a decided influence on the duration of positive stools (Table 7). Infants under 6 months of age tend to remain infectious longer than older persons. Twelve (48 per cent) of 25 in this age group had positive stools for 14 weeks or longer. A similar but less marked tendency is noted in infants 6 months to 1 year. In contrast, among older children and adults the rate of fall is more rapid after the 10th week of illness. Of 46 cases at all ages with positive stool cultures for at least 16 weeks, 14 were under 1 year of age. On the other hand, permanent carriers are for the most part limited to the older age groups.

In 8 of the 14 cases under 1 year of age, the organism was *S. typhimurium*,

TABLE 7

Persistence of Positive Stools According to Age Groups

Week	*0–1*				*1–9*		*10–29*		*30–49*		*50+*	
	0–6 Months		*6–12 Months*									
	No. Cases Still Positive	*Percentage of Cases Still Positive*	*No. Cases Still Positive*	*Percentage of Cases Still Positive*	*No. Cases Still Positive*	*Percentage of Cases Still Positive*	*No. Cases Still Positive*	*Percentage of Cases Still Positive*	*No. Cases Still Positive*	*Percentage of Cases Still Positive*	*No. Cases Still Positive*	*Percentage of Cases Still Positive*
1	25	100.0	11	100.0	133	100.0	255	100.0	152	100.0	103	100.0
2	24	96.0	11	100.0	129	96.0	246	96.5	139	91.4	93	90.3
3	21	84.0	7	63.5	97	72.0	202	79.2	108	71.1	66	64.1
4	19	76.0	6	54.5	75	56.0	137	53.7	85	55.9	51	49.1
5	14	56.0	6	54.5	52	39.0	95	37.2	54	35.5	43	41.7
10	12	48.0	4	36.4	11	8.2	12	4.7	22	14.5	19	18.4
20	8	32.0	3	27.3	2	1.5	3	1.18	14	9.2	10	9.7
30	3	12.0	2	18.0	1	0.7	3	1.18	12	7.90	7	6.8
40	3	12.0	1	9.1	1	0.7	3	1.18	12	7.90	7	6.8
50	2	8.0	1	9.1	1	0.7	2	0.78	11	7.23	5	4.9
60	2	8.0	1	9.1	..	...	1	0.39	9	5.92	4	3.9
67	1	4.0	..	...	..	...	1	0.39	8	5.26	4	3.9
67+	..	...	..	...	..	...	1	9.39	8	5.26	4	3.9

TABLE 8

Salmonella Infections: Widals According to Type

Type	No. of Cases Negative		No. Cases Suggestive Partial Positive		Total		Percentage of Cases Suggestive Partial Positive	
	Clinical	Subclinical	Clinical	Subclinical	Clinical	Subclinical	Clinical	Subclinical
S. paratyphi B	14	10	151	21	165	31	91.5	67.8
S. typhimurium	40	10	70	9	110	19	63.5	47.5
S. newport	5	2	10	1	15	3	66.7	33.3
S oranienburg	3	3	4	..	7	3	57.2	
All other types *	11	16	18	..	29	16	62.0	
Untyped	28	8	43	5	71	13	60.5	38.5
	101	49	296	36	397	85	74.5	42.3
Total	150		332		482		68.8	

* *S anatum, S montevideo, S. chester, S. panama, S. derby, S. cholerae suis, S. bareilly, S. senftenberg, S worthington, S. bredeney, S. manhattan*

the remainder being distributed among five other types. Three infants with *S. typhimurium* infections had positive stools for 1 year or longer, although freedom from infection was finally demonstrated in each instance.

2. *Widals*—Widals utilizing *S. paratyphi B* as an antigen were performed in 482 cases, 332 (68.8 per cent) of which manifested some reaction in a serum dilution of at least 1:40 (Table 8). This figure is influenced to a great extent by the large number of positive tests in *S. paratyphi B* cases (172 out of 196, or 87.7 per cent). Of 129 *S. typhimurium* cases, a rise in titer was found in 79 (61 per cent). Information concerning the widal tests was available for 81 subclinical cases; 34, or 41 per cent, were positive. The percentages in the two most common types were as follows: *S. paratyphi B,* 67 per cent (21 out of 31 cases); and *S. typhimurium,* 47 per cent (9 out of 19 cases). In 50 cases representing six Group C Salmonella types, we found an increase in titer in 21, or 42 per cent.

D. Permanent Carriers

During the course of our study, 15 permanent Salmonella carriers were discovered among the 811 cases (Table 9). Their distribution according to Salmonella type was as follows: *S. paratyphi B* 12, *S. oranienburg* 2, and *S. derby* 1. One *S. paratyphi A* carrier had been recorded several years ago. Twelve permanent carriers (5.1 per cent) developed among 235 *S. paratyphi B* infections; none among 267 *S. typhimurium* infections; and 3 (1.0 per cent) among 309 infections due to all other types. This indicates that permanent carriers are important reservoirs of *S. paratyphi B* infections.

Of these 16 carriers, 9 were convalescent cases which had been followed for 1 year. Seven of the 9 were type *S. paratyphi B.* In 2 instances, because of clinical symptoms referable to the gall bladder, cholecystectomy had been performed before the expiration of the usual observation period. One patient was cured of the carrier condition; the other died shortly after operation. Of the 7 remaining carriers, all of whom had been discovered in the investigation of sporadic cases, 5 were type *S. paratyphi B.* This was a striking finding because there were only 14 sporadic cases of *S. paratyphi B* in contrast to 281 sporadic cases due to other Salmonella types, among whose contacts only 2 carriers were discovered. The source-finding rate for the former was 35 per cent; for the latter, 0.7 per cent. In making this comparison we recognize that in an investigation it is impossible

TABLE 9

Permanent Salmonella Carriers
Massachusetts

Age	*Sex*	*Salmonella Type*	*Total Known Duration of Positive Stools (Weeks)*	*Manner of Discovery*	*Results of Bile Drainage*	*Type of Injection*
32	Female	*S. paratyphi B*	314	R *	not done	C ‡
37	"	"	308	R	" "	C
11	Male	"	202	R	positive	C
71	Female	"	169	E †	not done	S **
55	"	"	167	E	positive	S
45	"	"	108	E	"	S
35	"	"	105	E	"	S
42	Male	"	102	R	not done	C
42	Female	"	66	R	" "	C
64	"	"	52	E	" "	S
41	"	"	40	R	" "	C
56	Male	"	30	R	" "	C
67	Female	*S. paratyphi A*	80	R	" "	C
55	"	*S. oranienburg*	135	R	" "	C
44	"	"	104	E	positive	S
54	"	*S. derby*	148	E	"	S

* = Release culture on cases
† = Found in epidemiological investigation
‡ = Clinical infection
** = Subclinical infection

to demonstrate whether a healthy person discovered to be carrying a Salmonella organism is a permanent carrier or is suffering from a subclinical infection which will eventually develop into the permanent carrier state.

Bile specimens were obtained by duodenal drainage from 6 permanent carriers (4 *S. paratyphi B*, 1 *S. oranienburg*, and 1 *S. derby*). The etiological agent was demonstrated in the gall-bladder contents in each instance. This indicates that in permanent Salmonella carriers, if persistent excretion of the causative organism takes place only in the stools, the gall-bladder is the focus of infection. One *S. typhimurium* case had been followed for 67 weeks before the stools became negative. Examination of the bile 1 year after onset and while the stools were still positive did not reveal the organism. Another case of the same Salmonella type, with positive stools for 48 weeks, is still under observation. The gall-bladder had been removed from this patient many years before, and bile drainage performed quite recently did not demonstrae *S. typhimurium*. However, x-ray studies of the large bowel revealed diverticula which may account for the continued presence of the organism in the feces.

Three of the 16 carriers were males and 13 females. Except for a boy of 11, all our carriers were 32 years of age or older at time of discovery, the average age having been approximately 46 years. It is, therefore, apparent that some types of Salmonella organisms share with the typhoid bacillus [38] a predilection for the gall-bladder of the middle-aged female. Further investigation along these lines will differentiate those types which may in a certain percentage of cases localize permanently in the gall-bladder from others, like *S. typhimurium*, which may be harbored solely in the intestinal tract.

E. Clinical Manifestations

Clinical descriptions were available in 711 cases (Table 10). The principal groups were as follows: gastroenteritis, 425 cases (59.8 per cent); continuous fever, 110 cases (15.4 per cent); and subclinical infection, 162 cases (22.8 per cent).

In our experience, hard and fast dis-

TABLE 10

Salmonellosis: Clinical Diagnosis, By Types

Type	Gastroenteritis	Subclinical	Continuous Fever	Other *	Other Unrelated Disease	Total
S. typhimurium	189	39	13	3	1	245
S. paratyphi B	98	51	45	..	..	194
S. newport	15	6	6	..	1	28
S. oranienburg	9	13	3	..	..	25
S. montevideo	9	12	3	..	1	25
S. cholerae suis	7	..	7	..	..	14
S. derby	5	5	2	1	1	14
S. panama	4	1	3	..	..	8
S. urbana	3	1	..	..	..	4
S. anatum	2	3	1	..	..	6
S give	2	..	..	..	..	2
S bareilly	2	2	1	..	1	6
S. senftenberg	2	2	3	..	..	7
S. newington	2	..	..	..	..	2
S. chester	1	1	..	..	..	2
S. worthington	1	..	1	..	..	2
S. bredeney	1	..	..	..	..	1
S. enteritidis	1	2	..	..	..	3
S. muenchen	1	1	2	..	..	4
S. manhattan	1	..	..	..	..	1
S. tennessee	1	2	..	..	..	3
S. kentucky	..	1	..	..	..	1
Not typed	69	20	20	3	2	114
	425	162	110	7	7	711

* 4 abscesses (1 *typhimurium*, 3 untyped); 2 meningitis (1 *typhimurium*, 1 *derby*); 1 respiratory (*typhimurium*)

tinctions between Salmonella fever and septicemia were often unjustifiable. In some cases the clinical syndrome, having been initiated as typhoid-like fever, might easily have been regarded during its subsequent course as a septicemia because of septic localization. By the same token one might attempt to differentiate between typhoid fever and typhoid septicemia.

Of the 425 cases of gastroenteritis, 189 (44 per cent) were caused by *S. typhimurium*, and 98 (23 per cent) by *S. paratyphi B*. The remaining 69 typed cases (16 per cent) were distributed among 19 other Salmonella types. A considerable proportion of the *S. paratyphi B* cases (98 out of 143 clinical cases, or 68 per cent) manifested gastrointestinal symptoms. Although in several of these the intestinal symptoms became less prominent later in the course, they constituted, nevertheless, the most striking part of the illness.

Although *S. paratyphi B* cases represented only about 29 per cent of the total number (194 out of 711), this type accounted for 45, or 40.9 per cent, of all the continuous-fever cases. Only 13 *S. typhimurium* infections were included in this category. Continuous fever was the prime clinical manifestation in 6 *S. newport* cases and 7 *S. cholerae suis* cases.

Of 162 subclinical cases, 51 (31 per cent) were *S. paratyphi B*, and 39 (24 per cent) were *S. typhimurium*. A significant number of the *S. oranienburg* and *S. montevideo* cases were subclinical, namely 13 out of 25 of the former, and 12 out of 25 of the latter. Except for *S. cholerae suis*, subclinical cases were frequently noted among all the more commonly occurring types. No evidence of subclinical infection could be found in the examination of the contacts of 5 *S. cholerae suis* cases.

The first reported isolation of *S. tennessee* and *S. urbana* [17] from clinical

cases was made from Massachusetts patients. Previously the former had been recovered only from a healthy temporary carrier, and the latter from fowl and swine.[3]

In 7 cases the Salmonella infection appeared to be incidental, or secondary to some other disease. Three of these "incidental" cases proved to be fatal.

There were 17 other deaths among all our clinical cases, giving a fatality rate of 2.6 per cent. Several of the *S. typhimurium* deaths occurred among the aged inmates of an institution during the course of an outbreak.

Some estimate of the severity of Salmonella infections may be derived from the number of cases requiring hospitalization. Out of 295 sporadic cases, 180 (61 per cent) were admitted to hospitals by attending physicians. That severe cases are not limited to any particular age group is indicated by the fact that these hospital admissions were fairly evenly distributed among all ages. Seventy-one *S. typhimurium* cases were hospitalized even though this organism is usually said to produce comparatively mild infections.

COMMENTS

Further study is necessary in order to evaluate more definitely the rôle of animal sources in the human spread of Salmonella infections. It must be borne in mind that organisms of the bacillary dysentery group do not require animal hosts for their continued propagation. It is conceivable that the interchange of Salmonella organisms between man and other hosts may prove not to be the most significant factor in the epidemiology of salmonellosis.

We have in many instances observed the spread of Salmonella infections from case to case. We have seen how the proper recognition of one misdiagnosed case might have prevented eight infections among the contacts in two families. On at least three occasions nurses were infected while caring for Salmonella cases. In each instance transmission occurred without the mediation of animal hosts.

It is our belief that Salmonella infection spreads through the population in small groups of clinical and subclinical cases. Clinical cases may be regarded as indicators of lines of transmission which should be utilized in setting up barriers to check the spread of Salmonella infection.

Subclinical infections, unrecognized and unreported cases, are more important than chronic carriers in the epidemiology of Salmonella infections. It must be emphasized that temporary carriers are for limited times just as infectious as permanent carriers and are just as capable of producing food-borne outbreaks.

For all of these reasons, we have felt ourselves compelled to keep all reported Salmonella cases under observation as long as they remain infectious. By breaking chains of spread in this manner, we believe that many cases have been prevented. In keeping 67 infected food handlers from their occupation, it is possible that some outbreaks may have been averted. At the present time, when the control of diarrheal diseases is of extreme importance, we cannot feel justified in disregarding obvious sources of Salmonella infection.

SUMMARY

1. The stress of war conditions demands better control of diarrheal diseases. Salmonella organisms are important causes of such diseases.

2. This study is based upon 811 cases of Salmonella infection: 356 epidemic, 408 sporadic, and 47 discovered accidentally.

3. The 356 epidemic cases occurred in 17 outbreaks: 11 food-borne, and 6 contact outbreaks.

4. The 408 sporadic infections occurred in 295 households. Four types (*S. typhimurium, S. newport, S. paratyphi B,* and *S. oranienburg*) accounted for 70 per cent of the sporadic cases

5. Investigation of 295 sporadic cases dis-

closed 113 additional infections among the contacts: 46 clinical cases and 67 subclinical.

6. Of the 711 cases in which clinical records were available, 425 (59.8 per cent) manifested gastroenteritis, 110 (15.4 per cent) continuous fever, and 162 (22.8 per cent) no symptoms (subclinical infections). *S. typhimurium* was the most frequent cause of gastroenteritis and *S. paratyphi B* of continuous fever. These two types were also the cause of 57 per cent of the subclinical infections.

7. All age groups are susceptible to Salmonella infection. However, 39 per cent of our sporadic *S. typhimurium* infections occurred in those under 10 years of age.

8. Convalescents are infectious for long periods: 43 per cent showed positive stools in the 4th week after onset, 18 per cent in the 8th week, and 11 per cent in the 10th week. Positive stools persist as long in subclinical infections. Positive stools persist longer in infants under 1 year of age, and longer still in those under 6 months.

9. Sixteen permanent carriers of Salmonella organisms have been recorded in Massachusetts: 12 *S. paratyphi B*, 2 *S. oranienburg*, 1 *S. paratyphi A*, and 1 *S. derby*.

10. Twelve permanent carriers (5.1 per cent) developed among 235 *S. paratyphi B* infections; none among 267 *S. typhimurium* infections; and 3 (1.0 per cent) among 309 infections due to all other types. This indicates that permanent carriers are important reservoirs of *S. paratyphi B* infections.

11. In all Salmonella types persistent convalescent carriers, subclinical, and unrecognized cases are more important sources of infection than permanent carriers.

12. Although Salmonella organisms are common to man, animals, and birds, the interchange between lower animals and man may prove not to be the most significant factor in the spread of salmonellosis.

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U. S. Public Health Service Scope Broadened by Legislation

On July 3 President Roosevelt signed a bill aimed to broaden the scope of the U. S. Public Health Service and authorizing federal grants for research by non-government institutions, larger appropriations to aid state public health work, and the establishment of a national tuberculosis program. The bill also provided that public health nurses might be commissioned under the Public Health Service.

The President's statement regarding this legislation was as follows:

The Public Health Service Act is an important step toward the goal of better national health. A constituent of the Federal Security Agency since 1939, the United States Public Health Service is one of the oldest federal agencies—and one in which the people have great confidence because of its excellent record in protecting the health of the nation.

The act signed today gives authority to make grants-in-aid for research to public or private institutions for investigations in any field related to the public health. It authorizes increased appropriations for grants to the states for general public health work.

It strengthens the commissioned corps of the Public Health Service for the enormous tasks of the war and the peace to come. Authority is granted to commission the nurses of the Public Health Service, just as the nurses of the Army and Navy are commissioned.

It provides for the establishment of a national tuberculosis program in the Public Health Service. Since adequate public health facilities must be organized on a nation-wide scale, it is proper that the federal government should exercise responsibility of leadership and assistance to the states.

In establishing a national program of war and post-war prevention, we will be making as sound an investment as any government can make; the dividends are payable in human life and health.

Food Poisoning Caused by Hemolytic Staphylococcus in a Defense Plant*

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THE nurse was called from the dispensary at Kodak Park at 8:30 p.m. on August 3, 1943, to attend two employees who were violently ill with nausea, vomiting, and diarrhea. Shortly afterward, calls came from various parts of the plant to treat many others. Patients reporting to the main Kodak Park dispensary completely filled every room. It was obvious that we were confronted with a major emergency caused by some gastrointestinal irritant. A hasty survey showed that all cases came from among those people eating the evening meal in one of our numerous cafeterias. Some were in a severe degree of shock with cyanosis and cardiac arrhythmias.

With our own facilities taxed to the limit, it was decided to request aid from the chief Health Officer of the City of Rochester, Dr. Arthur M. Johnson who is also chief of the Emergency Medical Service of the Civilian Defense Organization. He promptly dispatched Dr. Norris Orchard, Deputy Health Officer, to our dispensary while he himself went to the control center of the Emergency Medical Service, according to a predetermined plan for caring for major medical emergencies in this area.

Hospitals were notified that an emergency existed. Beds were made available, and the emergency wards were staffed in readiness for the arrival of patients while the ambulances were sent from the hospitals.

Dr. Johnson directed the flow of ambulances from the scene to the various hospitals so that there would be no more patients at any one hospital than could be adequately taken care of at one time. It might be mentioned that when this organization was set up, no one thought it would first be needed to serve food poisoning cases on a large scale.

Each ambulance carried one very sick patient and four ambulatory cases. These patients were tagged at our dispensary with name, address, and the medication administered clearly indicated on the tag. In some instances it was necessary to insist firmly that hospitalization was necessary.

Preliminary treatment in our dispensary consisted in evacuation of the stomach as quickly as possible. The finger method was used, together with the drinking of large quantities of tepid water. These methods were effective. By the time the patients had left the dispensary, all their stomachs had been emptied at least once, and in some instances several times. Five patients, desperately ill, received ¼ grain of morphine sulfate by hypodermic. As no one knew definitely the cause of the symptoms at that time, it was decided to hospitalize every patient. This

* Presented before the Epidemiology Section of the American Public Health Association at the Seventy-second Annual Meeting in New York, N. Y., October 12, 1943.

probably was a good decision. Twenty-four patients were removed to the Strong Memorial Hospital, 15 to the Rochester General Hospital, and 10 to the Genesee Hospital. Treatments varied with the hospital but consisted in the main of forced fluids by mouth when tolerated and glucose and saline by vein. In one hospital magnesium sulfate by mouth, hypertonic salt solution by mouth, and oxygen to those who were cyanosed was used. Doctors and nurses worked long into the night.

Dr. David B. Jewett, senior physician at the Genesee Hospital, furnished a statistical analysis of the symptoms shown by 10 patients. All vomited, 9 had diarrhea, 5 very severely. All but 1 had abdominal pain, and in 3 cases the pain was very severe. Cyanosis was present in 2. Only 1 showed blood in the stool. There was 1 case of auricular fibrillation. The temperature was 100° or above in 7 cases, the highest being 103.2°. There was a leucocytosis of over 10,000 in 6 cases; the highest count was 31,000. In 4 cases there were albumin and casts in the urine. Cases at the Strong Memorial and Rochester General Hospitals showed in general the same signs, symptoms, and laboratory findings.

Dr. Charles M. Carpenter, for the Health Bureau, isolated hemolyzing staphylococcus in the vomitus in nearly all cases admitted to the Strong Memorial Hospital, and in some instances the same organism was isolated from the stool.

One patient later developed an acute appendix which was removed. Another developed suggestive symptoms but was not operated upon. One patient developed a low-grade pneumonia 6 days after his return from the hospital. This promptly responded to sulfathiazole therapy. There were no deaths. All cases, with the exception of the appendix case, returned to work after 4 weeks. Sixty per cent returned after the first week.

Eighty-one employees in all were affected. Thirty-two individuals who went home before being taken ill, or who went home rather than report to the dispensary, were treated either by home remedies or by the family physician. Their period of absence closely approximated those who were hospitalized. Symptoms in nearly all cases began from 2½ to 3 hours after a meal was ingested at the one dining room previously mentioned. The acute symptoms in most cases persisted through the night. For two or three weeks many patients complained of various aches and pains, abdominal cramps, and some degree of prostration. Most patients returned to work within 17 days.

One of our first interests, of course, was to determine the cause of this epidemic. It was soon evident that all the people affected had eaten their evening meal in one cafeteria, and they all had eaten corned beef.

The cafeteria system at Kodak Park consists of a main kitchen where food is prepared and distributed to various dining rooms about the plant. On the morning of August 3, 1,000 pounds of fresh corned beef was cooked and sliced with a mechanical slicer. It was distributed to five dining rooms. A portion was served at the noon and evening meals. After the noon meal, normal practice has been to take the unused portion of the food back to the main kitchen where it is refrigerated and prepared for the next meal. In an effort, however, to save gasoline, this practice was abandoned two months previously, and the plan called for refrigeration after the noon meal in the local cafeteria. This necessitated, in some instances, overloading of the refrigerators, as they were not planned to take care of this additional load.

There were no cases following the

noon meal. One patient ate corned beef at the same dining room both at noon and in the evening. This patient had no difficulties following the noon meal.

Closely following the episode, all food handlers were carefully examined by our Medical Department. One employee in the kitchen who handled the meat, presumably with a knife and fork, showed an infected, untreated laceration on the third finger of the left hand, culture of which, taken by the Health Department, showed a hemolyzing staphylococcus. From another employee with facial acne the same organism was isolated by the Health Department. This employee did not assist in the organizing or preparation of the food. It is assumed that the epidemic came about by the contamination of the corned beef by the infected finger. Quite possibly, although it was not proved, this meat was not refrigerated sufficiently in the ice box.

We are convinced that a daily inspection of the hands, arms, and forearms of the food handlers is necessary, and they should be asked at this time if they have any boils, pimples, or infections of any kind on any other part of the body. Ample refrigeration space should be provided for the proper refrigeration of foods, for it is known that bacterial growth proceeds very rapidly at room temperatures, and that standing for 5 or 6 hours is sufficient time for gross infection to take place. There should be some one person responsible for the carrying out of these precautions. Only eternal vigilance will keep a similar catastrophe from any large eating establishment.

We were acutely aware of the value of an organized Emergency Medical Service to the community. In any sizeable community it is possible for large numbers of people to be taken ill in this way or to be injured at one time, and an organization of this sort eliminates most of the confusion which is inevitable when large numbers of people require hospitalization within a short period of time.

Housing the Health Department—An Experiment in Rural Oklahoma

GERTRUDE NIELSEN, M.D., AND HENRY L. KAMPHOEFNER

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CLEVELAND COUNTY is located in the central part of the State of Oklahoma. It is adjacent to Oklahoma County where the capital, Oklahoma City, and the State Health Department are located. It has an area of 555 square miles. It has no industry and most of the land is not specially suitable for farming. There are one city and three townships, each having a high school as well as grade schools. The 57 one-room schools are spaced at the traditional 3 mile distance from each other. The county government is in the hands of three county commissioners. Norman, the county seat, has the city manager form of government. At Norman are located the State University with a normal enrollment of about 6,000 students and the Central State Hospital housing about 3,000 mentally ill patients.

The population of the county has increased from 27,728 in 1940 to 31,028 in 1943. In 1942 the stable character of this small town, rural and university community, was altered profoundly. The establishment of four naval projects attracted thousands of construction workers. After the completion of the bases about 20,000 sailors and their followers moved in. Crop failure compelled many farmers to leave the county to seek employment in industry. Thus, the population of the rural areas became depleted, while the urban centers became congested. Several federal and local housing projects are under construction to relieve this situation.

The Cleveland County Health Department was established as a four-member unit in the fall of 1936. During the first two years its housing facilities were inadequate. It was located in discarded storerooms on the second floor of Main Street stores or auto repair shops. Its waiting room was the WPA sewing room, and visitors had to wade through bundles of old clothes to get into the one room which served as interview, examination, and treatment room. In one corner the director and the clerk shared the same desk. A notable improvement occurred in 1939 when the county commissioners rented a neat 5 room residence. In 1940 a new courthouse was erected and from the salvaged material of the old structure an annex was built to house the welfare departments, the food stamp office, and the health department. A community hall was included in the building. The whole department consisted of 5 rooms on the south which were not planned with any particular function in mind. A long hall served as a waiting room for patients as well as for clients of the welfare departments. In 1941 considerable equipment was added and the quarters were improved by venetian blinds and asphalt tile floors. By 1943 the staff had increased to a director, 2 sani-

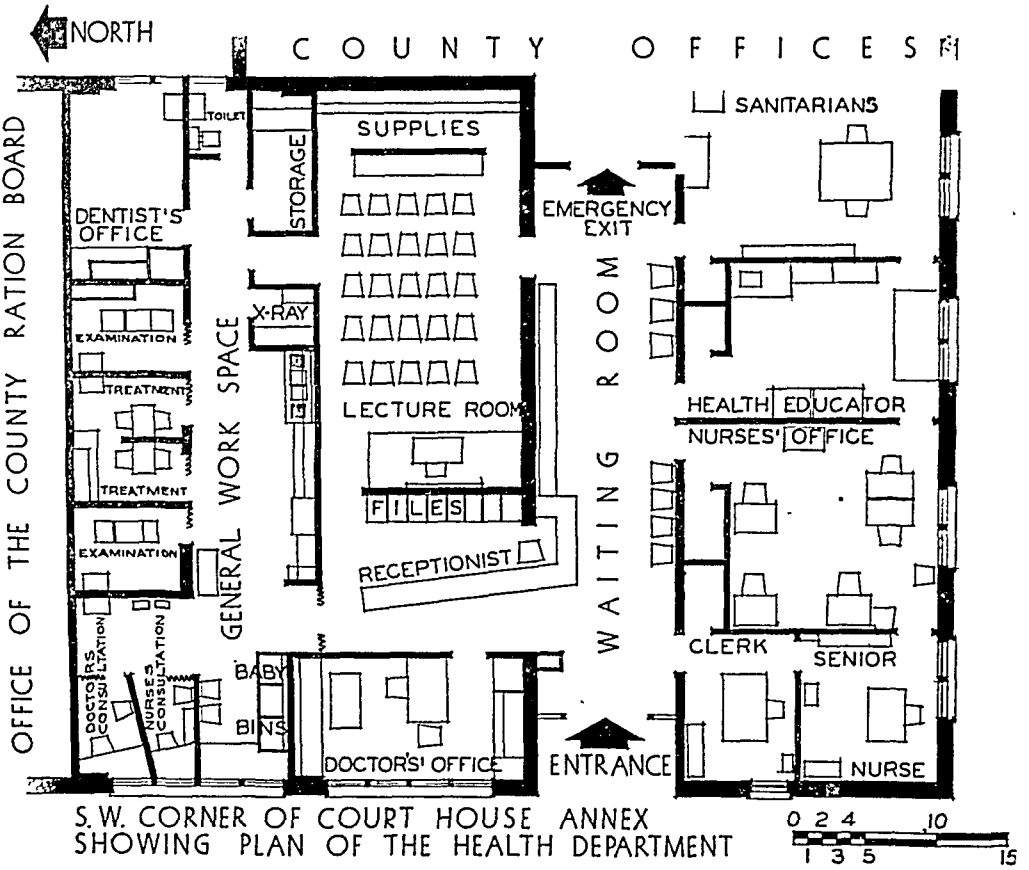


FIGURE 1—Floor plan. South of waiting room original quarters. North of waiting room newly converted space.

tarians, 5 nurses, 2 clerks, a follow-up worker, and a manual helper. The budget had grown from $9,000 in 1936 to $24,760 in 1943, that is, from 36 cents to 79.8 cents per capita. Obviously the housing facilities were quite inadequate to take care of the work load.

In January, 1943, an application for additional space was made to the FWA. In March, 1943, the sum of $10,000 was granted by presidential order, and the conversion of half of the community hall was approved by the FWA and the county commissioners. On July 1 the contract was let. The work started 2 weeks later and was completed in 10 weeks.

In making the plans the function of each new unit was first considered and then the whole was tied together so as to insure compactness and functional efficiency. The original 5 rooms were readily remodeled into offices for the clerk, the senior nurse, the nurses, the health educator, and the sanitarians. The original waiting room was retained as such, but by making a new outside entrance and changing the original entrance to an emergency exit, the whole department was separated from the rest of the building. This conversion was easily done with very little expense.

The space north of the waiting room had an area of 32 by 60 feet; the ceiling was 14 feet high and the windows were high and narrow. In the conversion the ceiling was lowered to 9 feet and the windows were lowered and broadened. The bare cement floor was covered with asphalt tile.

Somewhat over $7,000 was spent on

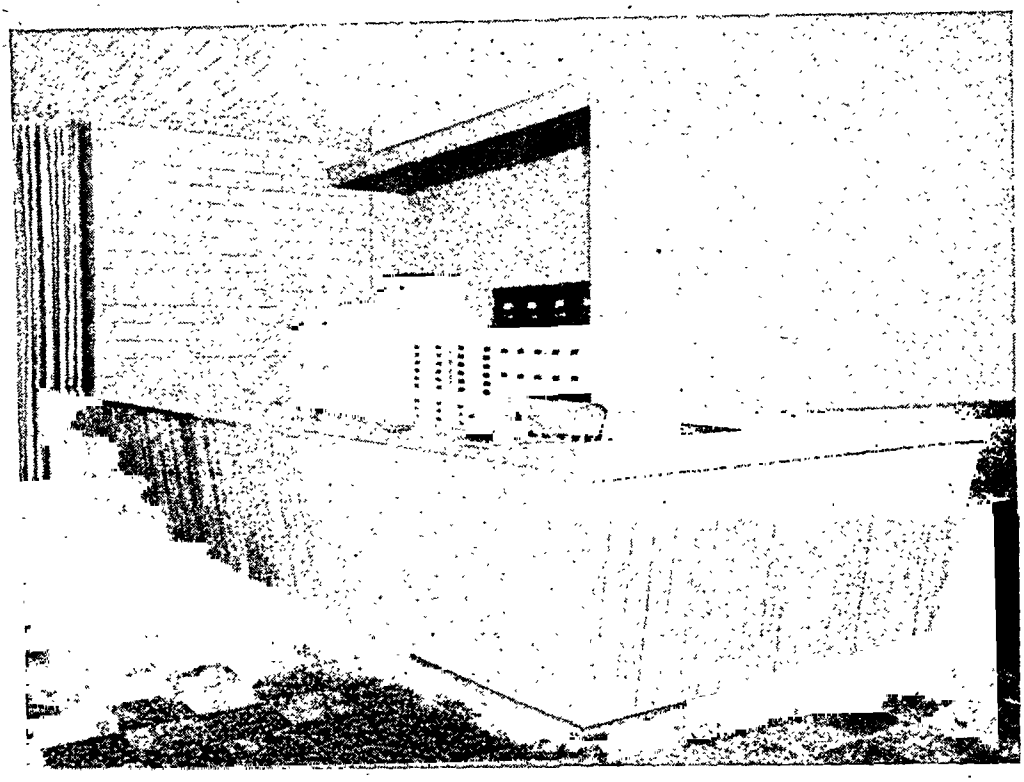


FIGURE 2—Waiting room with clerk's desk.

general construction in converting the old community hall into the various spaces and services as shown on the floor plan (Figure 1). Figure 2 shows the shape and simplicity of the general waiting room and clerk's desk. At the recommendation of the War Production Board, sani-finish tile walls were used to cut down on carpentry labor which at that time was critical in this area. All moldings, fixtures, extras, etc., were eliminated. Most of the lighting was from concealed sources, avoiding the use of expensive metal fixtures and giving better illumination. Many substitutes were worked into the scheme in line with the government's policy of conservation of critical materials.

Because of the definite limitation on exterior light or window space the function of the plan was carefully studied, and the services that could most easily be carried on without direct outside light were placed along the north wall, which was common to the Health Department and the County Ration Board. The clerk or receptionist was placed at a pivotal position to control the entire space, and the doctor's office was made easily accessible to all. All of the filing space was consolidated behind the receptionist's counter so as to be convenient for the clerk and easily accessible to the doctor and the nurses. Figure 3 shows the general work space with sink, refrigerator, and immunization table, with sterilizers on the right. Behind the curtained openings are two examination rooms and a treatment room. This room is divided into three spaces by a tile partition. With one set-up on the table the doctor can treat two patients alternately, with complete privacy for the patient.

The doctor's and nurse's consultation rooms were worked out with an oblique partition to handle the special



FIGURE 3—General work space. Behind curtained openings are two examination and two treatment rooms.

functions of their space. Figure 4 shows the arrangement of the latter room, and the bins for the undressing of the babies. Three babies can be handled at the same time under good natural and artificial light. A simple

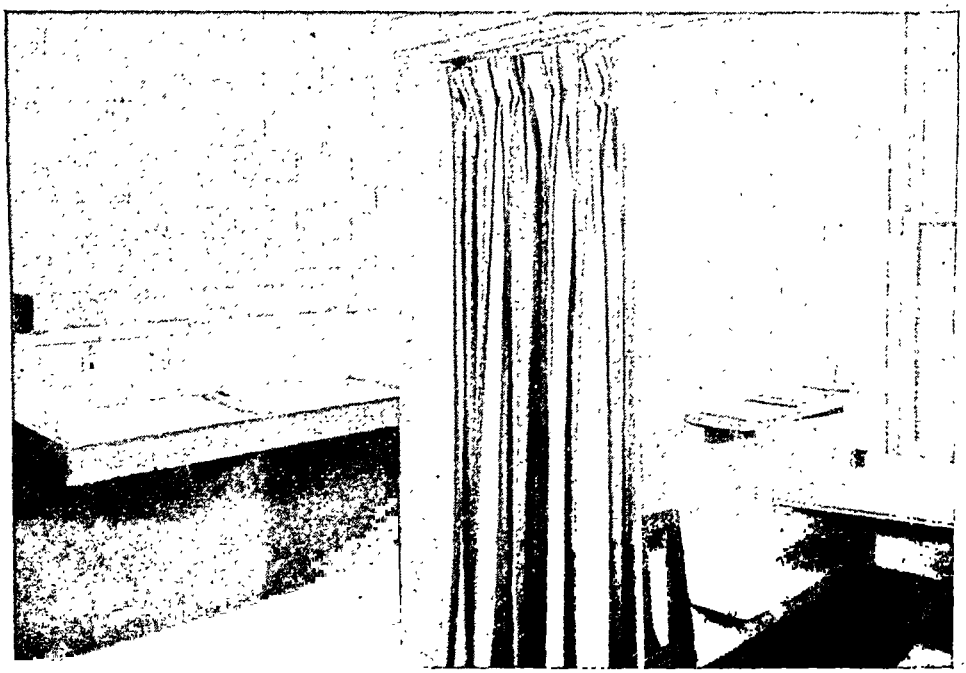


FIGURE 4—Dressing room for infants and nurse's consultation room.

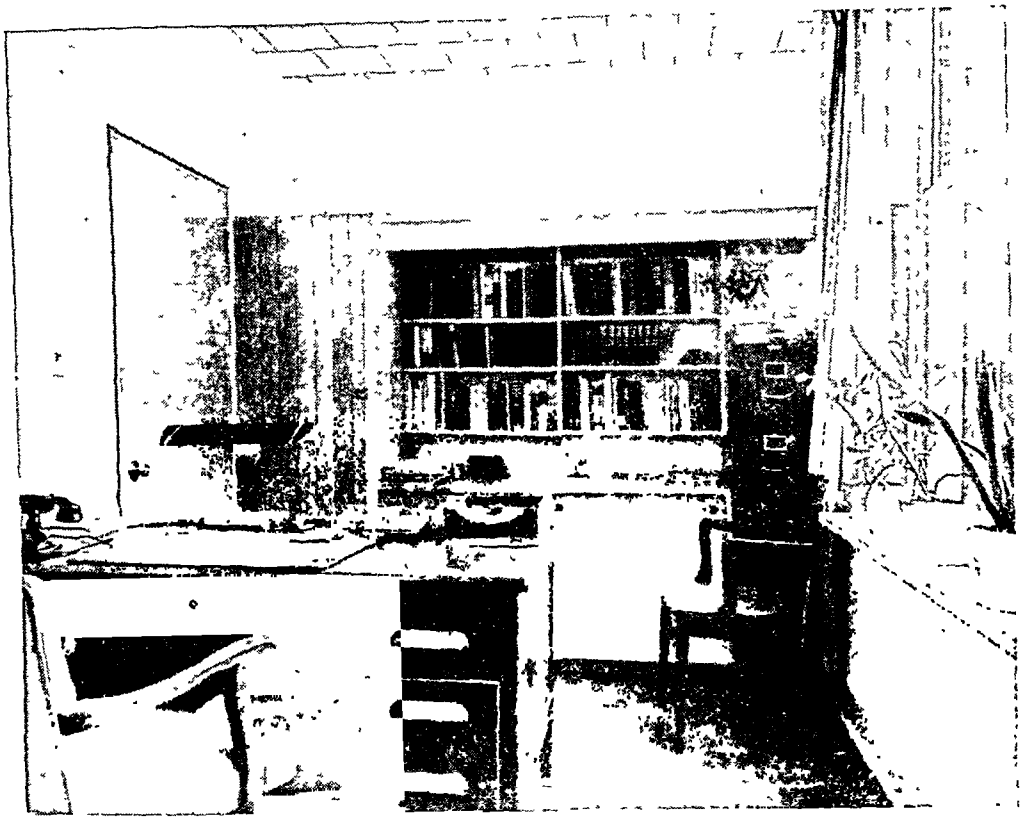


FIGURE 5—Director's office.

light trough above serves as shelf space for demonstration materials for the infant clinic. A shelf for scales and other equipment is conveniently located and ample room is provided for the mothers, out of the general circulation. Scales for the school children are placed against the wall facing the doctor's and the nurse's consultation rooms.

The doctor's office, shown in Figure 5, is a simple and workable arrangement of the requirements of the space. Figure 6 shows the class and demonstration rooms. The rear wall has an opening for a projector which is operated from the supply room. Blackboard, bulletin boards, speaker's rostrum and a lantern screen are an integral part of the room. This room is already a popular and valuable asset to the health department. On one afternoon a week a maternity class is held here. On infant and preschool and general clinic days demonstrations and films are shown. This room also serves as a meeting place for various health committees.



FIGURE 6—Class and demonstration room.

All of the space has been carefully studied for its particular use, with thought of simplification, ease of circulation, and efficiency. The cabinets have been worked out after a study of the use they would have. In the storage room there are a hot water tank and especially designed shelves for posters, school bags, incubators, etc. The supply room is lined with shelves and is for the storage of literature, and it consolidates this important part of the health program in an accessible and well organized space.

The arrangement can be easily adapted to special activities. On x-ray clinic days screens for individual dressing rooms for men can be set up in the lecture room and the examination rooms used for women.

In the preliminary development of the working arrangement, a study was made of published health department layouts, with considerable attention given to the comprehensive analysis of health department requirements made by Marshall Shaffer and August Hoenack of the U. S. Public Health Service in Washington, D. C.*

* Published in the *Architectural Record*, July, 1942. (Reprints available on request from A.P.H.A. office.)

Thirtieth Anniversary, New York City Bureau of Health Education

Commissioner Ernest L. Stebbins of the New York City Department of Health announced on July 1 that the Bureau of Health Education of the New York City Health Department had completed 30 years of activity. New York City was a pioneer in developing health education programs, the beginnings of which grew out of the tuberculosis campaign initiated in New York City in the early 90's and which demonstrated the superiority of educational measures over the former practice of mere police enforcement.

Since 1914 the Bureau has steadily expanded its facilities until today it makes use of every recognized publicity medium to teach good health to the residents of the city. During the past year each month there have been supplied to the public between 200,000 and 300,000 booklets and pamphlets on the widest variety of health topics and about 250 motion picture showings a month have been arranged. Extensive use of the radio has been made with frequent spot announcements, and neighborhoods are being organized as communities for educational projects against tuberculosis, diphtheria, syphilis, gonorrhea, and other communicable diseases as well as on behalf of a nutrition program. Savel Zimand is Director of the Bureau of Health Education.

An Automatically Controlled Suction Device for Field Air Sampling*

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IN practically all industrial hygiene studies and investigations, air sampling of contaminants is a necessary part of the procedure. For a few of these contaminants, special devices have been designed and constructed with which it is possible to determine their concentration directly in the field. For others a measured quantity of air may be obtained by the use of evacuated flasks, aspirating bottles or gas pipettes.

For the great majority, however, the technic consists of passing air at a suitable rate of flow through one or more absorption bottles, tubes, or similar devices capable of trapping the contaminant. After this is done the sample is brought in to the laboratory for analysis.

The volume of air to be thus sampled depends upon the sensitivity of the chemical method and the accuracy desired. Usually, the larger the sample taken, the more accuracy is possible in the chemical determination.

In regard to the chemical determination, we have the advantage of a variety of methods, the accuracy and sensitivity of which are usually well known and controlled. But it is well to remember that just because the chemical determination of the contaminant is accurate, it does not necessarily follow that the final result, that of the concentration of the contaminant in air, is equally accurate. This is due to the fact that the overall accuracy also depends upon the accuracy with which the air volume has been measured.

The measuring of the air volume, under field conditions, presents numerous difficulties which often result in errors far exceeding those associated with the chemical procedures. Furthermore, these errors are largely unpredictable because they are introduced as a result of various limitations in the measuring devices or conditions associated with the device used in aspirating the air.

The most common means used today for producing the necessary air flow through an absorber is some sort of a suction pump usually driven by an electric motor, but sometimes manually operated. The device used for measuring the air flow is either a vacuum gauge or, more often, the conventional Venturi type flow meter. While these instruments are capable of registering the air flow with good accuracy under controlled conditions, such as may be obtained in the laboratory, field conditions are often such that highly accurate information of the air volume sampled is difficult to obtain. This is due to the fact that these devices are not integrating the air flow over the entire period of sampling, but are only indicating the rate of the air flow at any given moment. Consequently if an ac-

* Presented before the Industrial Hygiene Section of the American Public Health Association at the Seventy-second Annual Meeting in New York, N. Y., October 14, 1943.

curate estimate of the air volume is to be obtained it is imperative that the air flow remain constant. It is this requirement which is the most difficult to achieve, and the failure to maintain uniformity is, I believe, responsible for most of the errors associated with air flow.

When using motor operated pumps repeated line voltage variations cause corresponding variations in the motor speed and consequent changes in the rate of air flow. These variations become especially serious at low rates of flow if it is obtained by controlling the motor speed with a rheostat and thus causing the motor to run below rated voltage. Particularly is this true with respect to small fractional H.P. motors of the universal type which are desirable to use for reasons of versatility. Some improvement may be had by using a constant voltage controlled motor in combination with a bleeder valve in the suction line. However, our experience has been that this will not satisfactorily control the air flow, especially at low rates of flow. That is because constant voltage does not necessarily result in constant speed, it being achieved only when the electrical and frictional resistances have become constant.

Other disadvantages associated with the liquid flow meters mentioned are:

1. Accidental loss of liquid in transportation
2. Loss of liquid due to surges produced by stepping on the suction hose or accidental breaking of its connections
3. Condensation of water in extremely cold weather, causing water to enter the u-tube or condense on the orifice
4. Difficulties in changing orifices when widely different ranges of air flow are desired

Consequently, if highest accuracy is to be obtained it requires two persons to obtain a sample; one to operate the suction device and one to pay attention to the collection of the sample.

In order to overcome the above difficulties, all of which are detrimental to an efficient and accurate sampling technic, our office undertook to develop an improved type of instrument which in its final form proved to be satisfactory.

In planning this instrument, certain minimum specifications were set up which it had to meet to be considered successful.

1. Air flow should be automatically, or at least semi-automatically, controlled.
2. It should be simple in construction and at the same time rugged, and easy to operate.
3. It should be applicable to both low and high sampling rates with equal accuracy; that is, in the range from 0.5 liter per minute to 28.3 liters (1 cu. ft.) per minute.
4. Parts should be easily accessible in the case for cleaning and repair.
5. It should be light in weight for maximum portability.

Theoretically the problem looked relatively easy. Several schemes were tried with regard to controlling the air flow automatically, and instruments were built and tested. While they met the specifications with regard to flow control, they did not satisfy the above specifications in one or more respects. Not until an entirely new type of flow meter had been devised, was a satisfactory solution achieved.

Inasmuch as this flow meter is very easy to construct and has proved exceedingly accurate and useful in connection with hand operated suction devices, it will be described in detail.

Basically the flow meter consists of a vertical cylinder in which a piston is allowed to move freely. The piston is provided with an orifice the size of which depends upon the rate of flow desired. When suction is applied above the piston, air will flow through the orifice. At a certain vacuum the pressure on the underside of the piston will be great enough to lift it and make it travel up in the cylinder. When the piston is floating steadily at any one

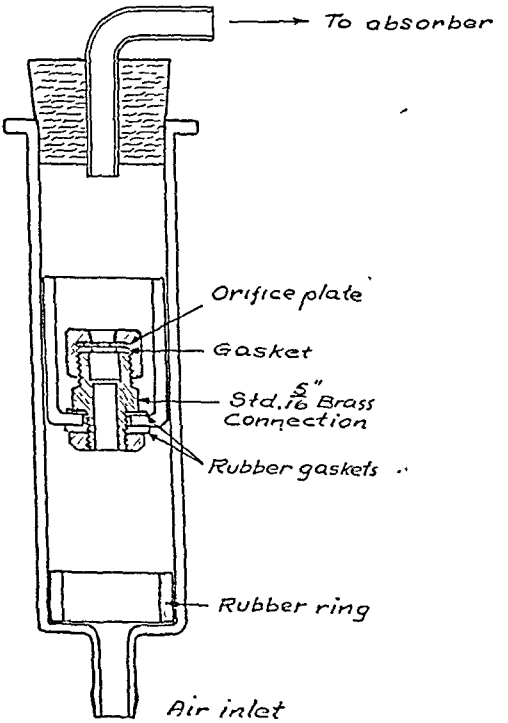
point, the air passes through the orifice at exactly the desired rate. A slight excess in the rate will make the piston rise, a slight reduction will make it fall.

In practice it is rarely possible to operate a suction device so uniformly that the piston will remain stationary for any length of time nor is that desired. It should be operated in such a manner that the piston is slowly rising and falling. *It is to be noted that the volume of air passing through the orifice in excess of the rated volume while the piston is rising a certain distance is exactly equal to the amount of reduction in air volume passing through while the piston is falling the same distance.*

Thus the average rate of flow will be exactly equal to that obtained if the piston were kept stationary.

Construction of the flow meter—A flow meter of the type shown in Figure 1 may be constructed from a 50 ml. hypodermic syringe. One discarded due to a broken tip will do as well as a new one.

FIGURE 1



The plunger should move easily in the barrel. Test it, after first inserting a rubber ring in the bottom of the barrel for protection, by holding it in a vertical position and letting the plunger drop of its own weight. It should travel smoothly and evenly to the bottom. Repeat the test a number of times, each time turning the plunger a fraction of a turn. If in any position the plunger should jam or slow up, indicating a tight fit, the barrel and plunger should be reground until satisfactory performance is obtained. This is easily done by making a thin slurry of fine carborundum powder in water, drawing a small amount of it into the syringe and working the piston back and forth with a rotary motion, turning the plunger now and then a fraction of a turn.

After having obtained the desired fit, have a glass blower replace the fine bore tip of the syringe with a 1″ piece of glass tubing, 6 mm. inside diameter, to serve as air inlet. Cut off the plunger 1½″ from the lower end and grind the edge flat. This piece will serve as the piston of the flow meter. Drill a ⅜″ hole in the center of the bottom of the piston to take a standard 5/16″ brass connection as indicated in the drawing. The brass connection is provided with an orifice plate made of sheet brass or lead and screwed tight by means of a cap against the seat which is covered with a gasket. The cap should be center-drilled with a 3/16″ drill. The size of the orifice is determined by the trial and error method.

It is of course possible to cement a suitable size orifice directly over the bottom hole of the piston and obtain desirable results. However, the use of the brass connection not only provides a simple means of exchanging orifices but also provides added weight to the piston. A heavy piston will be relatively less influenced by frictional resistance in its up and down move-

TABLE 1

Calibration Data

Test No.	*Liters Passed*	*Time in Seconds*	*Rate of Flow lit./min.*	*Deviation from Average Per cent*
1	7.1	903	0.472	−0.21
2	7.1	901	0.473	±0.00
3	7.1	902	0.472	−0.21
4	7.1	899	0.474	+0.21
5	7.1	899	0.474	+0.21
6	7.1	901	0.473	±0.00

Average rate of flow = 0.473 lit./min.
Max. deviation from average = 0.21%

ments. A total weight of 45 to 50 gm. has proved to be the most satisfactory.

A piston may also be made from brass, as has been done in the instrument later to be described.

A flow meter constructed according to the above description was provided with an orifice to give a rate of flow of approximately 0.5 liters per minute. In calibration tests it was connected to an absorber and air drawn through by means of a midget impinger pump (which had been slightly altered to serve the purpose) and operated in prescribed manner. The air volume was measured by means of a wet meter.

As shown in Table 1 calibrations gave an average rate of flow of 0.473 liters per minute with a maximum deviation from the average of 0.21 per cent.

Automatically controlled air flow—The idea suggested itself that this device could be modified to control the air flow automatically. The simplest possible means for accomplishing this would be to let the piston itself cut off the air stream when the desired rate of flow is exceeded. Such an arrangement is shown in Figure 2. It is similar in principle to that used in the M.S.A. midget impinger.

In practice, this device would be operated so that the rubber pad attached on top of the piston would press against the air outlet.

Two different locations of this flow meter are possible; (1) in front of the absorbers, and (2) at the outlet of the suction device. In the former case, suction is applied to the outlet of the flow meter; in the second case, pressure is exerted at the inlet.

Table 2 shows calibration data for both locations under various conditions. The air flow was produced by means of a motor driven rotary pump. Inasmuch as it was desired to obtain figures which would reflect the maximum variations which it might be possible to obtain in the field by various operators, the suction pump was operated at arbitrarily chosen speeds without any attempts to obtain any check results. Study of Table 2 shows that while this control device after proper refinement might possibly be used if connected in front of the absorber, it is unsuitable if used on the outlet side of the pump.

For practical reasons, however, it is highly desirable to use the flow meter on the outlet side of the pump. Con-

FIGURE 2

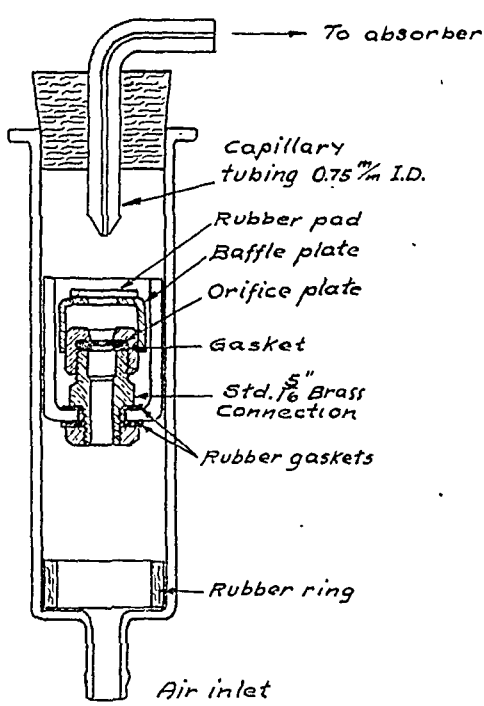


FIGURE 3

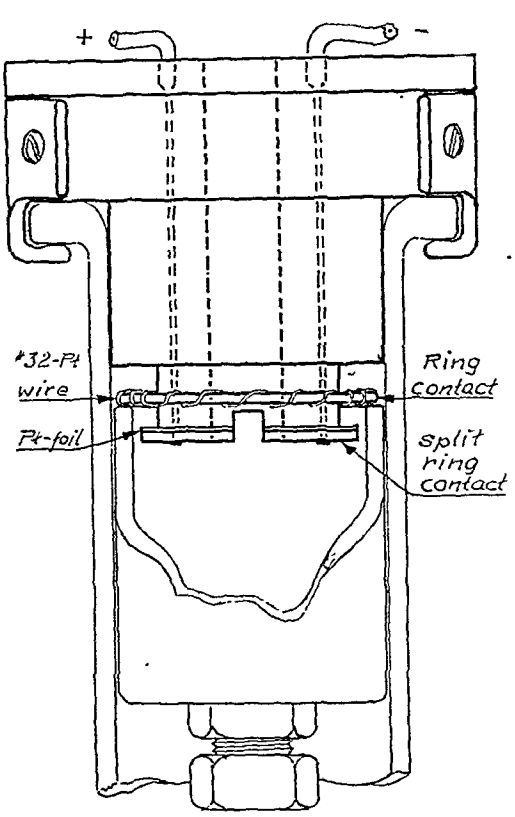




TABLE 2

Calibration Data

Suction

Test No.	Operation of Suction Pump	Rate of Flow lit./min.	Deviation from Average in Per cent
1	Slow—Just enough to raise the piston	0.479	−0.8
2	Increased speed	0.498	+3.1
3	High speed Air hose collapsed	0.492	+2.3
4	Same as No. 1	0.462	−4.3

Average rate of flow = 0.483
Max. deviation from average = 4.3%

Pressure

1	Low speed	0.535	± 0.0
2	High speed	0.774	+44.7

sequently, some other means of controlling the air flow had to be found. As shown in Table 1 the most accurate air flow is obtained when the plunger is slowly rising and falling. It was felt that this mode of action should be maintained and be utilized for controlling the air flow.

The use of a photoelectric device, where the piston would interrupt a beam of light when rising to a certain point, was considered as a possibility for controlling the motor driving the pump. However, this was considered too delicate and complicated to incorporate in a field instrument and was abandoned in favor of a directly actuated switch. In order to obtain maximum reliability such a switch should fulfil the following requirements:

1. Have the capacity to carry the total operating current.
2. Produce instantaneous response when actuated.
3. Require minimum power for its operation; that is, not materially resist the movement of the piston.

4. *Electrical contacts should resist corrosion and pitting.*

After a number of different types of switches had been designed and tried, the design shown in Figure 3 finally proved satisfactory.

Essentially it consists of a metal ring of slightly smaller diameter than the cylinder, and free to move up and down a small distance. Normally this ring is resting on the two halves of a split metal ring permanently fastened to the lower end of a cylindrical plug made from plastics. The diameter of this split ring is slightly less than the inside diameter of the piston. Each half of the split ring is electrically connected to the opposite terminals of a fixed resistance which in turn is connected in series with the motor. The piston when traveling upward will eventually lift the ring, thus opening the short circuit which in turn slows down the motor, causing reduction in air flow. As a consequence, the piston will travel down until the metal ring again makes contact with the split ring and thus short circuits the resistance and speed up the motor. To insure good electrical contact, the ring contact is wound with platinum wire and the contact surface of the split ring halves covered with platinum foil. A suitable condensor is connected across the terminals of the latter to minimize arcing.

The plug may be turned from any convenient plastics. It should be provided with means of holding it securely in place in the top of the cylinder. A hole 3/8" in diameter bored through the center serves as an outlet for the air.

Inasmuch as very small fluctuations are accomplished by the plunger when in operation, it is best to provide a tripod on which the plunger rests when not operating. This may be easily constructed by soldering three stiff wires to the inside wall of a 1" long brass tubing of slightly smaller diameter than the inside diameter of the barrel. The points on which the plunger rests should allow a clearance between the plunger and the ring contact of from 1/4" to 1/2".

FIGURE 4

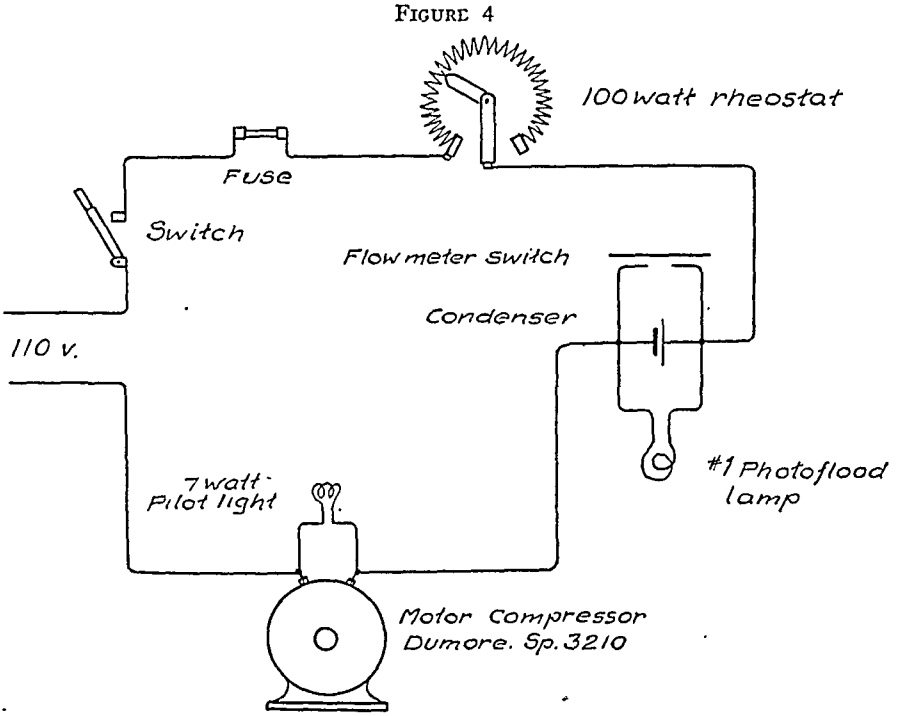


Figure 4 shows the wiring diagram of the assembly. For good operation the fixed resistance mentioned above should be so selected that approximately 10 volts variation occurs across the motor between the open and closed position of the switch at full load. With the type of motor compressor shown, this is achieved with a No. 1 Photoflood lamp. Incidentally this lamp may be used as a visual indicator of how the device is working. In the model shown, a pilot light visible through the panel also serves the same purpose. This light is connected across the terminals of the motor. It enables the operator to see at a glance even from a considerable distance whether the collection device is working properly or needs adjustment. A fast flicker of the light indicates proper operation. If the light is steady the speed is either too slow or too fast.

No lubricant is used or needed. As a matter of fact, if lubricant is applied the piston will stick, which prevents the device from functioning. For this reason a trap, preferably filled with copper wool, should be connected in the line between the pump and the flow meter to prevent the accidental entry of oil into the cylinder.

Hinged panels on the case are provided to permit easy access for inspection, cleaning, and repair. A trap is located on the inlet side of the pump identical in construction to that on the outlet side. These traps not only serve as protection for the pump and the flow meter but also act as mufflers against the otherwise noisy operation of this type of pump.

Table 3 shows calibration data obtained with this instrument. An effort was made to simulate the various ways the instrument might be operated by different operators. Thus the maximum deviation of 0.95 per cent shown in the table should represent the highest error to be expected at any time. While this in itself is an extremely good performance, even better results may be obtained if each individual operator calibrates the air flow, running the instrument in the same manner as he would do it in the field. Personally, being familiar with the instrument, I have no difficulty in obtaining any number of calibrations showing less than 0.5 per cent variations.

Theoretically there should be no difference in the rate of flow when absorbers of different resistances are used on the suction side. In the previously shown calibrations one absorber was used in the tests because with this type of absorber we have as yet

TABLE 3

Calibration Data of Automatically Controlled Suction Device
(one absorber used)

Test Run No.	*Manner of Operation*	*Volume of Air Passed Through Flow Meter*	*Time of Run*	*Rate of Flow lit./min.*	*Deviation from Average in Per cent*
1	Lowest practical speed—Lamp resistance barely glowing	56.8 lit.	27'03"	2.10	−0.95
2	Low speed — Lamp resistance glowing faintly	"	26'58"	2.11	−0.47
3	Higher speed—Lamp resistance glowing strongly	"	26'44"	2.12	±0.00
4	Highest practical speed—Lamp resistance glowing very strongly	"	26'27"	2.14	+0.95
5	Motor started cold the following day — Operated like Sample No. 2	"	26'45"	2.12	±0.00

Average rate of flow = 2.12 lit./min.
Maximum deviation from average = ±0.95%

found no need for greater numbers when sampling. However, recognizing the possibility that such occasion might occur the experiment recorded in Table 4 was performed. Notice the high vacuum required for these absorbers at this rate of flow. The drop in rate of flow becomes progressively higher with each additional absorber.

TABLE 4

Comparison Between Rates of Flow When Using Different Numbers of Absorbers in Series

Number of Absorbers Used	*Suction Required Inches of Mercury*	*Rate of Flow lit./min.*	*Variation of Flow in Per cent*
1	2.5	2.12	±0.0
2	5 0	2.08	−1.9
		2.08	
		1.97	
3	7.5	1.99	−6.6
		1.98	

While this performance was not noticed when the instrument was new but showed up in this test after about 150 hours of operation, it must be taken into consideration if the pump has to work against very high resistance. It is caused by air leaking in through the bearings of the rotary pump. Consequently it is advisable, as is the case with all these devices, to make periodic calibrations, and especially when unusually high vacuum is to be used for inducing the air flow.

The instrument just described and demonstrated has proved itself exceptionally trouble-free. This is probably due to two factors: the presence of the protective traps on each side of the pump and the reliability of the switch. The latter is, of course, the source from which most of the trouble would be expected. However, since the instrument was built and passed through the experimental stages, it has been in use approximately 150 hours, during which time the switch has opened and closed without a single failure for an estimated million and one-half times, a record which seems rather satisfactory.

While the instrument as described was designed to meet our own demands for portability and refinements, I see no reason why the control device could not be successfully adapted to some of the already existing suction devices. I suggest that you try it. If you succeed I shall feel happy to have contributed, in whatever small degree it may be, to the achievement of that other freedom we also so ardently desire, namely, freedom from trouble.

American Journal of Public Health
and THE NATION'S HEALTH

Official Monthly Publication of the American Public Health Association

Volume 34 August, 1944 Number 8

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CLIFFORD CAUDY YOUNG

THE death (on June 5) of "Cy" Young was a blow to the cause of public health in the United States and a saddening loss to the hosts of his friends and colleagues.

Born in 1887, Young took his A.B. and M.S. at Kansas, studied for a time with Sedgwick at M.I.T., and received the degrees of Dr.P.H. (1924) and D.Sc. (Hon., 1942) at Michigan. He served for two years as an officer (S.C.) in the First World War, and was appointed Director of the Bureau of Laboratories of the Michigan State Board of Health in 1919—a position which he held until his death. He married Minna Crooks, one of his associates in the laboratory in 1925. He headed the Department of Preventive Medicine and Public Health of the Wayne University College of Medicine from 1931 to 1938. He was a Charter Fellow of the A.P.H.A.; and served as Chairman of the Committee on Meetings and Publications (1932–1936) and member of the Executive Board (1941–1944).

The Laboratory of the Michigan State Health Department was Dr. Young's life work and will always remain his monument. Beginning with thirty-six thousand diagnostic tests, he built this branch of service up to over one million tests a year. He developed a state-wide system for the supply of completely free biologic products; and among the many fruits of this system was one of the most sweeping reductions in an initially high diphtheria death rate ever accomplished in the United States. He was a pioneer in the control of goiter by iodization of water supplies; and one of his last major accomplishments was an admirable program for supplying free blood plasma to every citizen in need of that almost magic remedy. Paul de Kruif has stated that this state laboratory was "one of the most functionally beautiful and powerful life-saving institutions in human history."

We have used the words "served" and "service" three times in this brief editorial; and it is an idea which is inevitable in connection with "Cy" Young. His complete technical skill and great administrative ability was infused with an almost passionate zeal for bringing the fullest resources of medical science to

every man, woman, and child in Michigan. De Kruif has said that, in the death of Dr. Young, " our state has lost the most valuable of all its citizens."

To all public health workers, the career of Dr. Young should be a reminder of the real significance of what we are doing, and trying to do. Steadily and undramatically—often without public recognition—the health officers, the engineers, the doctors, the nurses, the laboratory workers, and the rest are rendering a service which represents one of the most precious of all contributions ever made to the welfare of the human race.

THE NEW WORLD ORDER

THE aims of the American Public Health Association are primarily technological and relate to the clarification of objectives and the improvement of procedures in the field of public health practice. Public health is, however, one of the most far-reaching of human endeavors. It cannot be limited by national boundaries, since the disease germ operates under all flags. The recently discovered new type of epidemic jaundice is a problem in Berlin and in Moscow, as well as in Cairo. Nor can the specific challenges of public health be separated from the wider problems of national and international economics. The first step in the control of tuberculosis and infant mortality—in France, in Poland, in China—must be the provision of food for starving populations and the restoration of those populations to a status of economic independence.

The health officer, with his colleagues in the various specialties of public health, has a vital interest in the development for the post-war period of a world health organization of some sort. Whether it should be based on a reactivation of the Health Section of the League of Nations (which is still in being), or the health services now being developed by UNRRA, or on some new organization yet to be created, is a problem for the future. It is certain, however, that we need international machinery to maintain a world-wide system of epidemiological intelligence; to provide consulting field service and grants-in-aid to nations needing help in dealing with special problems; to negotiate sanitary conventions; to establish international technical commissions for the coördination of the best available knowledge in regard to malaria, venereal disease, tuberculosis, maternal and child health, housing, nutrition, medical care, and the like; and to coördinate facilities for the training and distribution of personnel. An outline of possible approaches to the " International Organization for Health " has been prepared and is available for study and criticism.[1]

The public health worker, as a citizen—and somewhat more directly than the average citizen—should also be concerned with the larger framework of international association, of which international health must form a part. The future of the world is being decided on the battlefields of Europe and the South Pacific. It is also being decided by deliberations of the chancelleries of Washington and London and Moscow; and these deliberations must be largely guided by intelligent and informed public opinion.

Two books have recently appeared which should materially aid us, in the United States, in the development of such an opinion.

There are two real dangers to be avoided, the Scylla and the Charybdis of international planning. The first of these is hopeless pessimism—which is fostered and reënforced by the sinister influences of special vested interests and narrow isolationism. As an antidote to this trend, *How to Think about War and*

Peace, by Mortimer J. Adler [2] may be recommended. Mr. Adler looks far ahead. He gives us a blueprint of a world order which he admits may not be reached for five hundred years; but he demonstrates with clarity that such a world order is logical and necessary as an ultimate ideal.

In the United States, wise planning on an international scale is, perhaps, more endangered by undue optimism than by over-pessimism. We are too accustomed to think that Utopia may be attained at one leap by a world conference and the signing of a set of resolutions. Perhaps this point of view is influenced by the common conception that our own Declaration of Independence and Constitution emerged from nothingness by an act of creative imagination. We should remember that these documents represented the distillate of some centuries of democratic experience in the England from which the founding fathers came. Social institutions grow by practice; they do not emerge, like Minerva, full-fledged from the brain of Jove.

To the over-optimist, *How New Will the Better World Be?* by Carl L. Becker [3] may be strongly recommended. Professor Becker shows us that nationalism and the concept of the sovereign state, imperialism and power politics, cannot be abolished by resolution. They represent actualities with which we must deal. Yet in his last two chapters, the author indicates how—within the framework of reality—it is possible to do the two essential things—to maintain peace, temporarily by force; and to build gradually but steadily toward those economic adjustments which alone can make peace by mutual consent a possibility.

An article by Forrest Davis [4] outlined last spring what the author considered to be the post-war international policy of our Government. It is a policy which has not yet been contradicted by any official acts at Washington, and is a policy in essential accord with that outlined by Becker. It involves essentially two things. First and foremost, the peace must be maintained—in the name of the United Nations and in the interest of all of them—but actually by the air forces and navies and armies of the four powers which alone will have armed forces and industrial resources of overwhelming power. There is no reason to believe that the United States and Russia would for a moment consider the abandonment of those powers in favor of an international police force beyond their effective control. There is good reason to hope that the four Great Powers would be ready to use their forces with intelligence and foresight in the common interest.

Parallel with this temporary expedient should go the creation of a fully-representative and democratic assembly of the United Nations (and ultimately of all nations of good will) for the development of international policies and the direction of technical commissions (dealing with agriculture, currency, trade, health, labor conditions and the like). From such a structure, a more closely-knit world order can be evolved, by trial and error and through the development of national confidence in the machinery developed.

Such a solution satisfies neither the extreme isolationist nor the extreme internationalist. It is the middle way, in accord with the educational principles of "learning by doing." It is the immediate hope of a world where, as ever before—"politics is the art of the possible."

REFERENCES

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TUBERCULOSIS AS AN ECONOMIC PROBLEM

THE specific cause of tuberculosis is the *Mycobacterium tuberculosis;* but the most common factor associated with this disease is the economic one. Whether tuberculosis is considered from the standpoint of the individual, the family, or the community, the financial factor stands out prominently in the blueprints of cause and effect. Therefore, tuberculosis is both a medical and a social problem. It is as sound public economy to provide the necessary medical—and social—services for the control and prevention of tuberculosis as it is to spend public moneys for a safe water supply, proper sewage disposal, and fire and police protection.

It has been estimated that the average case of tuberculosis represents a community liability of approximately ten thousand dollars. It is a fact that less than 6 per cent of the families in which the disease occurs are financially able to meet this cost. Accordingly, the taxpayer is paying the bill for tuberculosis whether he realizes it or not. And yet, failure to give full recognition to the many economic aspects of the disease, as well as the adoption of short-sighted and pennywise public policies, are unquestionably postponing the time when the real cost involved may be further reduced.

Encouraging progress has been made in the control of tuberculosis by the application of epidemiology and clinical medicine. But the benefits would reach farther and last longer if equally effective measures were adopted to remove the common economic barriers associated with the disease. Failure to recognize these barriers, or failure to do something to overcome them, results in waste of effort and waste of social resources. The success which has crowned the efforts to eradicate tuberculosis in cattle has been due largely to the recognition that fundamentally it is an economic problem, to be overcome only by the intelligent expenditure of public funds. Sufficient public moneys should similarly be provided and expended within the framework of democratic processes to meet the individual and family needs in overcoming human tuberculosis.

It is wishful thinking to conclude that the optimum in health protection is being realized from the more than one hundred million dollars invested in public tuberculosis hospitals in the United States and from the millions spent annually for their operation, and for case finding. All too frequently the application of the "means test"—the question of ability to pay—does more than any other circumstance to limit the benefits which should accrue from these expenditures. Patients who accept segregation and treatment in a tuberculosis hospital are acting in the public interest. Except in the case of the very few who are well able to pay for their care, family resources for the essentials of healthful environment should be conserved and no payment should be required. The recent elimination by New York State of all requirements for a financial investigation in the case of patients admitted to county tuberculosis hospitals is an admirable step. Where such a policy is in force we have a situation almost unique in the field of American medicine—the provision of what is essentially the best available medical care in one special field for all citizens of the community.

The greatest profit to the individual, the family, and the community results from the discovery and treatment of the disease in its early stage. The x-ray is essential for early diagnosis, and x-ray facilities must therefore be made readily and universally available for all individuals as an element of a progressive public

case-finding service. From an epidemiological viewpoint it may be just as important to know who does not have tuberculosis as it is to know who has the disease. Consequently, the profit from the liberal use of the x-ray should not be expressed only in terms of cases diagnosed.

Equally fundamental in tuberculosis, and even more commonly ignored or neglected, are the related environmental conditions which contribute to the spread and development of the disease. Of particular importance is the problem of housing. Insufficient emphasis is customarily placed on the need for more healthful living conditions, particularly for families in which there has been tuberculosis. Many families who are financially able to meet the cost of acute illness become impoverished in the face of this disease.

Poverty or the fear of poverty, more than any other single factor, changes the tides of battle in favor of the tubercle bacillus in the individual or the family. Poverty engenders crowding, ignorance, nutritional deficiencies, and medical neglect, all of which create a favorable soil for the tubercle bacillus. The result is that benign infections become malignant, closed or sputum-negative cases become open or sputum-positive cases, the spread of germs becomes constant and massive, and cases multiply.

The essentials of tuberculosis control are early discovery and prompt and adequate treatment and segregation. Anything which prevents the attainment of these objectives impedes progress in controlling the disease. The economic factor is such an obstacle. It is common; it is often serious; it has a profound influence on the development and management of tuberculosis.

The needs are clear. There must be wider and keener recognition of the existence of this barrier to progress, and there must be courageous leadership in the execution of steps for its removal.

New Developments in Health Education*

Public Health Education Section

IN preparing this report the committee did not undertake a detailed survey of our field. It sent out no questionnaires. Instead it relied on informal inquiry addressed to a few people in various parts of the country who presumably would know about outstanding new developments. By this method and while all attention is focused on the war it is not unlikely that many important new things have escaped our attention.

NATIONAL DEVELOPMENTS IN THE UNITED STATES

At the national level one of the most significant developments is the expanded interest of the U. S. Public Health Service. An experimental in-service program conducted for its own employees in Washington has brought it the added responsibility of directing a health education program for all government employees, under Congressional authorization. Stimulated by its leadership many local health departments have begun training of health education personnel and have sponsored courses, workshops, and scholarships in health education for teachers.

During the last two years the Service has directed demonstrations in 90 southern areas on the use of teachers during the summer months for community education for malaria control. The rapidly widening program of education of food handlers pioneered by Texas has received increased impetus through the appointment by the Service of eight individuals to carry on this program in its regional districts.

Perhaps the greatest new development in health education, measured in terms of dollars spent and people reached, has been in the field of nutrition. Under the leadership first of the Office of Defense Health and Welfare Services and later the Food Distribution Administration, the nutrition program has had the participation of many government offices, state and local official, and unofficial agencies and commercial organizations. There must be few people in the United States upon whom its educational message has not impinged. Incidentally, this program also has set an interesting pattern for the utilization of the vast resources of business for health education under government direction.

Another war-born federal activity is the Physical Fitness Program under the leadership of the Federal Security Agency in coöperation with other federal agencies.

A program that has great implications for the future is that of the Federal Public Housing Authority. This agency has appointed a Director of Health Education and is urging its Project Service Advisers to assist with the development of health education programs in the housing projects.

The committee has not attempted to review the extensive programs of the Army, Navy, Office of War Information, Office of Foreign Relief and Rehabilitation Administration, and other

* Committee on New Developments in Health Education Organized 1942.

wartime agencies. It should be noted here, however, that as a result of the work of these agencies millions whom our health education efforts have only lightly touched in the past are now being reached with health education through newspapers, periodicals, pamphlets, movies, radio, and in classes all over the world.

Among the national voluntary agencies an outstanding development is the study by the National Health Council which is nearing completion. This study reached into many communities and its report should have a wide effect in sensitizing the country to the needs and opportunities for health education.

During the past year or two the contributions of business and industry have noticeably increased, particularly in the field of nutrition education.

Under new direction the National Safety Council and its local affiliates have stepped up programs on safety education, aided by industry, the War Production Board, and other government agencies, and special projects, such as the unique Safety Zone Program of the Zurich Insurance Companies.

STATE PROGRAMS

Several interesting developments have occurred in the states. Florida and Illinois have created large autonomous state-wide Public Health Committees. Nebraska and Pennsylvania and Utah have set up local Health Assemblies. California has sponsored local Health Institutes. Illinois, Indiana, Oklahoma, and North and South Carolina, among others, have initiated programs of training health education personnel for their health departments. Other states in other ways give evidence of increased appreciation of the necessity for health education under trained direction in any well rounded public health program.

LOCAL PROGRAMS

Of far reaching importance is the growing movement for organized citizen interest in community health activities. Sometimes stimulated from above, but frequently arising from forces within the community, this stirring at the grass roots gives great hope for a wide support of all health actvities in the future. Noteworthy developments have occurred in Boston, New York, Hartford, Bridgeport, Detroit, and in local areas in North Carolina, South Carolina, and Oklahoma.

MATERIALS

Out of these many programs and others there has come a wealth of new materials for our use, much of it better than ever before. Leaflets, pamphlets, exhibits, radio scripts and, in a few instances, films are being designed for particular groups using appeals to reach people in new kinds of work, new communities, new conditions of marketing, budgeting, and living. A healthy sign in a time of strain is the somewhat more frequent use of humor, a useful but sometimes dangerous tool. There is evidence of increasing collaboration among interested groups in the preparation of materials, such as that between health and mental hygiene workers, and between tuberculosis workers and public health nurses. There is also more emphasis on securing editorial help from mothers and others for whose use materials are being planned.

Key sources of new material are:

The Cleveland Health Museum for exhibits

The U. S. Public Health Service, particularly for posters and pamphlets

The U. S. Department of Agriculture, regional offices of the *Food Distribution Administration* and state and local *Nutrition Committees* for a wide variety of nutrition materials including lists of additional sources

The U. S. Office of Education for publications on the Physical Fitness Program prepared in coöperation with the Army, Navy, U. S.

Public Health Service, and the Office of Community War Services

The U. S. Children's Bureau for information on the free Emergency Maternity and Infant Care Program for wives and babies of enlisted men

The U. S. Department of Labor and the *National Safety Council* for materials on Safety in the Home, on the Farm and on the Job

The Planned Parenthood Federation of America for materials on family planning in relation to public health

The American Film Center for a new and excellent annotated list of health films for lay audiences

For other references to materials, books, and programs, Section members are referred to the monthly "Credit Lines" in the *American Journal of Public Health,* and *Channels,* published by the National Publicity Council. Among the important new books are Dr. Nyswander's *School Health Problems,* the Report from the American Museum of Health on "What the Public Knows About Health," and the American Association of School Administrators' *Health in Schools.*

A dramatic expression of the reawakened interest in health exhibits is the "Healthmobile" of the Brooklyn Tuberculosis and Health Association which is on display at this meeting.

PERSONNEL TRAINING

Keeping pace with the expanding horizons of health education, colleges and universities have accelerated and modified their educational programs. As a background they now have available the "Proposed Report on the Educational Qualifications of Health Educators."* This stresses the importance of field experience and "internship" and mentions the place for graduate training. Although most schools have always offered some "field work" as part of their training in health education, the actual development of special field training courses originated as part of the health education program which began in September, 1941, when the U. S. Public Health Service in coöperation with the North Carolina State Board of Health launched the first of a series of demonstrations in community health education in war counties. To meet the demand for personnel which these demonstrations created, fellowships were provided by several state health departments and the W. K. Kellogg Foundation to send trainees for graduate work to the School of Public Health at the University of North Carolina beginning in March, 1943.

A second grant to the U. S. Public Health Service from the W. K. Kellogg Foundation has made it possible for Yale and the University of Michigan also to offer this broader training in health education. Grants for health education fellowships have also been offered by the Commonwealth Fund and the Institute of Inter-American Affairs.

In connection with grants from the latter organization the newly created School of Public Health at the University of California plans to offer a special course in Health Education to meet the needs of Latin Americans. Meantime it is to be regretted that the Health Education course at the Massachusetts Institute of Technology which has trained so many of our leading health educators will be discontinued next year.

DEVELOPMENTS IN CANADA

The Health League of Canada reports that it has initiated this year a National Immunization Week with large-scale sponsored advertising, poster distribution, and nation-wide radio hook-ups. It has also embarked on an extensive Industrial Hygiene program in coöperation with Canadian Industries. In the Province of Quebec it has sponsored a campaign for a province-wide pasteurization law.

* *A.J.P.H.*, 33, 8:998 (Aug.), 1943.

FOREIGN DEVELOPMENTS

In the Office of the Coördinator of Inter-American Affairs there have been established sections both on Health Education and School Health Education, and a program for Latin America, embracing training in this country and in Latin America, demonstrations and health education activities is now under way from that Office. In connection with these programs there was held on October 11 what may prove to be only the first of a series of Inter-American Conferences on Health Education.

From England there has arrived this year the first issue of a new quarterly *Health Education Journal,* published by the Central Council for Health Education, which it is interesting to note provided the weekly periodical *Index of the National Health Library* with a full column of material on health education for the first time in its history.

SUMMARY

These brief highlights demonstrate unmistakably that health education is a lusty adolescent which is earning and receiving a larger place in the family of public health specialties. It is clear, too, that the war has emphasized the need for health education and has given it means to expand.

Some of the governmental agencies responsible for post-war planning have requested plans for an adequate health education program after the war. It might be well for the Section to appoint a committee to work on such plans now and thus make available the experience of the profession for any plans that may be devised.

The committee regrets that there is not time to describe in some detail many of the various programs, projects, courses and materials which have been referred to, or to mention the splendid continuing programs of the scores of national and local official and voluntary agencies. It was frequently difficult to decide whether or not a development was "new." Being under a mandate from the Section to keep our report short, we have no doubt erred in the direction of omission. There must be many whose important contributions have been neglected in this brief compendium of new highlights. The committee asks their indulgence in view of Annual Meeting program limitations. Recommended additions to the report will be welcome.

The committee acknowledges the valuable contributions it has had from Drs. Coffey, Derryberry, Horning, Platt, Bauer, and Bates, and Mrs. Walsh and others in compiling its material.

HOMER N. CALVER, *Chairman*
LUCY S. MORGAN, PH.D.
KATHERINE Z. W. WHIPPLE

Report of the Archivist, 1943

Laboratory Section

NOTICE of honors and awards to members of the Section have appeared frequently in the literature during the year. Dr. John R. Mohler, Chief of the U. S. Bureau of Animal Industry, retired after twenty-six years' service. He has been awarded many honorary degrees and prizes during this time; the most recent, the Alumni Reward of Merit at the Founders' Day ceremonies on January 16 at the University of Pennsylvania.[1]

Charter and early members of the Section continue to be nominated for their distinctive services. Dr. Samuel Gate Prescott was awarded the Nicholas Appert Medal by the Institute of Food Technologists for his valuable contributions in the field of food technology, especially to the progressive development of food manufacture and processing. Since his retirement in June, 1943, as Dean of Science of the Massachusetts Institute of Technology, he has been called into consulting service by the Dehydration Committee of the U. S. Department of Agriculture.[2]

Brigadier General Frederick F. Russell, retired, was awarded the recently created Gorgas Medal for "exceptional meritorious service to preventive medicine for our armed forces," by the Association of Military Surgeons of the United States on December 15, 1942.[3]

The Maritime Commission has honored the small group of medical men who in earlier years made Johns Hopkins University famous throughout the world, by giving their names to new Liberty ships.[4] Dr. Welch's services are memorialized in the ship "William Welch."

The death of the following members and fellows is recorded with deep regret:

Frank C. Rainier
Whittier, Calif.
Elected Member 1940

James M. Brannon, Ph.D.
Urbana, Ill.
Elected Member 1929

Clarence N. Boynton
Phoenix, Ariz.
Elected Member 1916. Elected Fellow 1935

Charles R. Hoover, Ph.D.
Middletown, Conn.
Elected Member 1930

During the year the 1,018 members of the Laboratory Section were canvassed so that there might be as complete a record as it is possible to make at this time of the services and activities of the individuals and the Section in relation to the war. The 358 replies indicate the solid contributions of the laboratory to the medical and public health problems of the war period and to the educational and post-war situations.

The replies were examined by groups, that is, those from members in the universities and research institutes, in governmental service—from federal to municipal organizations — commercial and private laboratories, hospitals, and the Army or Navy, either in regular service, or under enlistment for the present war.

Enumeration of services and activities could have no statistical value, since the returns are not complete nor, as was expected, has it always been possible to state the specific project under investigation. These records do show, however, how extensively estab-

lished laboratory services have been utilized and that competent investigators are making important contributions to the varied and urgent practical needs of the war.

The greatest number of replies (83) is from the university-research-institute group. The number of projects directly related to the war is also highest in this group. Members are serving on the committees for the Investigation of Epidemic Disease of the Army and are consultants to the Secretary of War and to the U. S. Public Health Service. Under the Committee on Medical Research of the Office of Scientific Research and Development they are also engaged as Consulting Investigators or Responsible Investigators on specified and unspecified projects. Others are in active military service, frequently in highly responsible positions. The special war research projects at the universities are in practically all instances added to accelerated teaching schedules. In several instances the colleges have collaborated as units of the Army or Navy.

Twenty-three replies were received from members of the Section in government laboratories in the United States, Alaska, Hawaii, Canada, Jamaica, Mexico, and Puerto Rico. The variety and range of responsibilities and undertakings make this group alone a miniature American Public Health Association.

The official health departments of only 25 states and 3 Canadian provinces are represented in the replies to the canvass; but 62 replies were received from these 25 states. The flexibility of organization and the personal contributions that have made it possible to assume much added work, while at the same time there has been a serious loss in trained personnel, appear in this group. Members of the state and provincial laboratories are also among the consultants to the War Department, and they collaborate with the Area Service Command Laboratories by instructing medical personnel in laboratory procedures. State gas officers and gas consultants have also been selected from the staffs of the state laboratories.

Reports from members in 49 county and city laboratories in the United States and Canada, like those in state and provincial laboratories, show them to be carrying heavily increased schedules in all services. While members in the federal and state laboratories are seen from their reports to be engaged in policy-making and administrative phases of war work, those in the smaller local units participate immediately in the medical, public health, and sanitary problems of civilian protection and education. Members in the large city laboratories, however, are also represented in the national consultantships and war agencies.

The demands on maintenance and operation that are made on the outlying laboratories are illustrated in a reply from the Branch Laboratory at Anchorage, Alaska. The acting director reported the " designing and equipping of a two-unit portable laboratory for use in epidemiological field work; the laboratory can function away from any base for one month and has supplies for handling 400 contacts. The whole weight of 2 units is 200 pounds; both are designed for easy handling and rapid transportation."

The 54 replies from commercial and private laboratories record important and extensive research and service both in civilian and war needs, in medical, veterinary and agricultural projects, in dairy research, chemical warfare, and industrial hygiene.

Thirty-three replies from members with hospital affiliation list active participation in civilian medical service, blood donor service, and important research by Responsible Investigators under the Committee on Medical Re-

search of the Office of Scientific Research and Development.

Forty-two replies show only present Army or Navy affiliations, but they list the responsibilities that are associated with titles ranging from that of Assistant Medical Technician to Brigadier General.

The canvass has thus produced for the archives a record of the activities in this war period of more than one-third of the membership of the Section. The pattern of medical and health services to the nation is interestingly shown in the responses from members in all grades of government and hospital service. Valuable contributions have also come from their researches. Private laboratory enterprises are seen to augment the government organizations in a remarkable way. Members in universities and research institutes show significant contributions in a splendidly coördinated plan of investigation, which has a counterpart in the practical applications made under the direction of the Army and the Navy.

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AUGUSTUS B. WADSWORTH, M.D.

Examination of Water and Sewage*

Laboratory Section

THE following changes in bacteriological analysis of water, by the Standard Methods Committee on the Examination of Water and Sewage, which have been made in manuscript are submitted for your consideration:

1. The introduction of medium formulae for tryptone glucose extract agar and lauryl sulfate tryptose agar. The elimination of formulae for crystal violet lactose broth and fuchsin broth.

2. The introduction of methods for treating sample bottles with sodium thiosulfate and recommendation that chlorinated waters be collected in thiosulfate-treated bottles.

3. The introduction of tryptone glucose agar as an alternative to nutrient agar for plating water samples.

4. The term "coliform" be used to replace "coli-aerogenes" throughout the text.

5. The introduction of the following paragraph concerning media for the presumptive test:

"In these standard tests lauryl sulfate tryptose broth may be substituted for lactose broth in the examination of all waters except final filtered, treated and filter-treated waters. It may be substituted for lactose broth also in the examination of final, filtered, treated and filtered-treated waters provided the laboratory worker has amply demonstrated by correlation of positive completed tests (isolation of coliform organisms) secured through the use of lauryl sulfate tryptose broth with those secured through the use of lactose broth, in the examination of such waters, that the substitution results in no reduction from the density of coliform organisms indicated by the standard procedure using lactose broth."

6. Brilliant green lactose bile broth is the only liquid confirmation recognized. Fuchsin lactose broth, crystal violet lactose broth and formate-ricinoleate broth have been dropped as confirmatory media. Formate-ricinoleate broth can still be used in the completed test for detecting spore-forming bacilli.

The incubation period for brilliant green bile broth shall be 48 ± 3 hours at 35°–37° C.

W. L. MALLMANN, PH.D.,
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* Report of the Standard Methods Committee.

STANDARD METHODS COMMITTEE ON EXAMINATION OF WATER AND SEWAGE
Organized 1899. Reorganized 1933. Published reports: *Year Books* 1930–1931, 1934–1935, 1935–1936, 1937–1938, 1939–1940, 1941–1942, *A.J.P.H.*, May, 1943. 8 volumes published: 1905, 1912, 1917, 1920, 1923, 1925, 1933, 1936.

Examination of Germicides and Antibacterial Agents*

Laboratory Section

THE Report of the Standard Methods Committee for the Examination of Germicides and Antibacterial Agents comprises separate progress reports from the several Referees and Associate Referees.

STUART MUDD, M.D., *Chairman*

* Committee authorized 1941. First published Report *A.J.P.H.*, 33, 5:602 (May), 1943

Antibiotic Agents

Considerable progress has been made during the year on the formation, nature, and utilization of antibiotic substances produced by microörganisms. Some of the more significant results can be summarized as follows:

Penicillin, the most important antibiotic agent so far isolated, is now being produced in this country by 15 to 20 industrial organizations. The material can be used very effectively in the treatment of pneumococcus, streptococcus, and staphylococcus infections, some of which are resistant to the action of the sulfonamides. Progress has been made not only in the mass production of the penicillin, but also in our knowledge of its chemical nature and in its mode of action. Tyrothricin, produced by *Bacillus brevis*, has found extensive use in the treatment of mastitis in cattle, and in topical application in certain human infections.

Several new antibiotic agents have been isolated recently. *Penicillium notatum* was found to produce, in addition to penicillin, another factor, designated as *Escherichia coli* factor, penatin, notatin, and penicillin B. This is an oxidative enzyme, protein in nature, and active in the presence of glucose; its activity is neutralized by catalase. *Aspergillus flavus* was shown to produce two active substances: (a) aspergillic acid, that acts against both Gram-positive and Gram-negative bacteria, and (b) flavicidin, similar in every respect to penicillin. Streptothricin, produced by *Actinomyces lavendulae*, is a basic substance; it possesses limited toxicity and is active against Gram-negative as well as Gram-positive bacteria. Proactinomycin, isolated from *Proactinomyces gardneri*, is also a base, but it is active largely against Gram-positive bacteria.

Among the other substances recently isolated from microörganisms, it is sufficient to mention clavacin, fumigacin, claviformin, and penicidin. They differ in toxicity to animals and in their activity, some being active largely against Gram-positive bacteria, and others are active both against Gram-positive and Gram-negative bacteria. Very little is known concerning their chemical nature.

SELMAN A. WAKSMAN,
Associate Referee

Chemical Antiseptics

For the development of methods for testing antiseptics, associate referees have been appointed who are currently at work on various phases of the methods for testing antiseptics. The preliminary work that is now under way concerns the development of a medium for use in *in vitro* testing of antiseptic substances. This investigation is directed toward the development of a medium which will give constant results in the hands of different laboratory workers, particularly in the control of the resistance of the organisms to be used in the test.

Work is also under way on a study of the resistance of different types of organisms which are being considered for use in *in vitro* tests. It is contemplated that eventually in such tests we will utilize not only staphylococci, but possibly streptococci, coliform, and pseudomonas types as well. Through study of the resistance of different species of organisms it will be possible to bring out more clearly the inherent specificity of most germicidal compounds.

The *in vitro* testing of antiseptics is only a preliminary step in determining their efficacy, since the clinician is mainly interested in what an antiseptic is capable of doing under the actual conditions of use. Investigations are planned which will give us methods for determining the efficacy of germicides under the conditions of use in or on the human body. Such tests will include toxicity tests, both *in vitro* and *in vivo,* with the thought in mind that the value of the *in vitro* test lies mainly in its ability to eliminate the inefficient antiseptics, and the true worth of an antiseptic is only elicited through a study of it as near the actual conditions of use as it is possible to obtain.

Investigations are planned to include a study of the efficacy of germicides in the destruction of spores, particularly of the genus *Clostridium,* as they relate to those preparations offered for use for cold sterilization of surgical instruments. In connection with this, it should be pointed out that the referees involved in the investigations dealing with antiseptics and disinfectants plan to work closely together since the study of antiseptics, disinfectants, and fungicidal substances are so closely interrelated.

The associate referees on antiseptics met during these sessions to discuss plans for the investigations to be carried out during the coming year.

HENRY WELCH, *Referee*

Chemical Disinfectants

Restrictions on allotments of phenol and cresol for use as disinfectants have led, during the past year, to very great increases in the relative and gross amounts of synthetic preparations now being offered as disinfectants.

At the St. Louis meeting of this Association, a paper was read pointing out that in the case both of certain synthetic disinfectants and the more familiar coal-tar type, containing synthetic wetting agents, the conventional phenol-coefficient method of evaluating germicidal power may give widely divergent and deceptive results. During the year expressions of dissatisfaction with the F.D.A. phenol-coefficient method as a test for modern disinfectants have been received from several sources.

In the face of this urgent situation a subcommittee on disinfectants has been formed to study means of improving germicidal tests for these compounds.

Members of the subcommittee have been selected from a wide field and represent the manufacturers, the commercial examiners, academic, and government control interests in the problem.

Difficulties in the present procedure arise from the fact that the sensitivity of the test organisms, *Eberthella typhosa,* to certain germicidal substances is altered when it is cultured in media containing peptone of slightly different composition. The effect is not detectable by the organisms' reaction to phenol, i.e., by the phenol control. Other microörganisms such as *Pseudomonas aeruginosa* and *Escherichia coli* are relatively insensitive to these variations in the peptone. Three distinct approaches to the problem have been recognized as corrective possibilities and investigation on the three has been initiated. Dr. Mallmann of Michigan State College has instigated an endeavor to obtain a less unstable if not a constant strain of *Eberthella typhosa* or closely related organism suitable for use. Work on the resistance of a number of strains of *Pseudomonas aeruginosa* and *Escherichia coli* which might be used for testing purposes was commenced during the year. Efforts to locate a source of peptone of constant composition suitable for the culture medium have been under way for some time.

Information from the newly appointed associate referees indicates that the subcommittee is anxious to accomplish the work necessary to recommend improvements in the present testing procedure; and I feel that it may be in a position to do this within the forthcoming year.

C. M. BREWER, *Referee*

Detergents

The development of cationic and anionic wetting agents with germicidal or bacteriostatic properties opens a new field of application for detergents. There have appeared on the market a number of detergent-sanitizers in the past that upon investigation were found to be wanting both as good detergents and as sanitizers. To date the writer, upon investigating the claims of these products, has been unable to justify their uses. Several cationic compounds when mixed with detergent mixture offer marked possibilities as detergent-sanitizers that have practical applications. The writer expects to spend considerable time in the development of such products during the coming year. The past year the writer has been doing exploratory work on detergent-sanitizers and their practical usefulness.

W. L. MALLMANN, *Referee*

Disinfection of Air by Germicidal Vapors and Mists

Recent developments in the field of air sterilization with glycol vapors have shown that triethylene glycol is the most potent bactericidal and viricidal agent yet found.[1] This substance is highly lethal in concentrations of 1 gm. of the glycol dispersed in 200 million ml. or more of air for the respiratory pathogens and influenza virus. Toxicity tests on triethylene glycol consisting of maintaining monkeys and rats for many months to a year in an atmosphere saturated with this substance have revealed no deleterious

effects. Likewise the long continued ingestion of this substance has had no detectable harmful action.

Investigation of the various conditions which affect the germicidal activity of glycol vapors has shown that atmospheric humidity is of marked importance; a minimum of 35 per cent relative humidity being essential for the killing of dust-borne bacteria.[2] Practical application of the use of glycol vapors for the purpose of controlling air-borne infection has had to await the construction of suitable apparatus for the dispersion of glycol vapors into large enclosed spaces and the development of an instrument to control automatically the concentration of glycol vapor in the air. Rapid progress is being made in the solution of both these problems. Reports of the use of propylene glycol vapor in a children's hospital suggest that it was effective in reducing the incidence of acute respiratory infections.[3]

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2. Lecture before Harvey Society, Apr. 15, 1943.
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O. H. ROBERTSON, *Associate Referee*

Disinfection of Air by Ultra-violet Irradiation

A number of publications have appeared on the usefulness of upper air irradiation in the control of cross-infection in children's hospitals and infant wards. It appears that the use of ultra-violet irradiation of operating rooms and nurseries is now well established.

No publications are available on the application of ultra-violet irradiation in the control of air-borne infection in sleeping quarters. Such information is urgently needed since the crowding of men in large sleeping halls may require a quick decision on the possible use of ultra-violet irradiation in stopping cross-infection in military establishments.

Recent publications have again emphasized the importance of dust and lint as possible carriers of micro-organisms. Upper air irradiation would destroy only microörganisms and virus particles which come into the range of intense radiation. The use of floor irradiation has been suggested. The installation of fixtures for floor irradiation appears to be a relatively safe procedure since in general many floors have low reflecting power for ultra-violet radiation.

A new acceptance of ultra-violet irradiation for the purposes of disinfecting air has been published by the Council on Physical Therapy of the American Medical Association (*J.A.M.A.*, 122: 503–504, 1943). It is important to point out that anyone who is planning to install ultra-violet sources for air irradiation should study this acceptance most carefully.

ALEXANDER HOLLAENDER,
Associate Referee

Fungicidal and Fungistatic Agents

The Subcommittee on Fungicides is engaged in a critical examination of methods now used in fungicide testing. Comparative studies so far made have suggested that some of the technics in use should be modified but the subcommittee is not yet ready to recommend specific changes.

TEST ORGANISM

It has been found that a fungus carried under the name "*Trichophyton rosaceum*" and widely used as a test organism is actually a species of *Fusarium*. This is a saprophytic fungus unrelated to dermatophytosis. Attempts so far made to obtain an authentic culture of *Trichophyton rosaceum* have failed and it is concluded that the name has been incorrectly used in the reports of fungicide testing. The dermatophyte correctly designated *T. rosaceum* is, in any case, unsuitable for use as a test fungus because of its slow growth and sparse sporulation.

The selection of one or more fungi to be used as standard test organisms will require further comparative studies. So long as the fungicides to be tested are intended primarily for use against dermatophytosis, it is reasonable to select a dermatophyte. Of the three important genera of dermatophytes, *Trichophyton* is most important in the etiology of dermatophytosis of the foot and is also most suitable for use as a test fungus. The strain of *Trichophyton* selected should be stable, produce many conidia (spores), produce conidia of only one type (unicellular and of uniform size), allow preparation of a uniform suspension without clumping and without formation of surface films, and have a satisfactory resistance to heat or a standard fungicide. Many strains of dermatophytes will not meet these requirements. The strain chosen should be accurately described in terms of colony appearance, morphology, and resistance so that another strain can be substituted if the original is lost or becomes unsuitable for use. Stability in the dermatophytes is only relative. Any strain chosen will quickly and certainly mutate to produce an inferior strain unless it is frequently transferred and refrigerated between transfers.

TECHNICS

Specific problems of technic now being investigated include: the medium to be used, the selection of a suitable peptone, the relative advantages of liquid and agar media for production of conidia, methods of preparing a conidial suspension, proper density of conidial suspension, intervals of exposure, methods of withdrawal of sample, best type of medium for subculture of exposed sample, and selection of a suitable fungicide for standard comparison.

C. W. EMMONS, *Associate Referee*

Stillbirth and Maternal Mortality Rates*

Vital Statistics Section

THE Subcommittee on Maternal, Stillbirth and Infant Mortality has been set up to consider "the best method of computing Maternal Mortality . . . problems of stillbirth registration and the best method of stating the rate." †

This preliminary report is limited to general considerations of the stillbirth rate and to one method of supplementing the maternal mortality rate. The broader aspects of the problem of stillbirth registration and of the different kinds of measures for maternal mortality require more extensive and elaborate investigations, which the subcommittee hopes to continue.

STILLBIRTHS

Definition—The Model Vital Statistics Act ‡ recommends the following definition: "Stillbirth means a birth after at least twenty weeks of gestation in which the child shows no evidence of life after complete birth." "Evidence of Life" is further defined as follows: "The words 'Evidence of life' include heart action, breathing, or movement of voluntary muscle." The laws of only one-half of the states are in complete agreement with the above definition. The laws of the other half of the states and of the District of Columbia differ from the above definition in one or the other of the two criteria. Nine of the states are not in accord with the Model Act in the definition of "evidence of life." Fourteen states and the District of Columbia differ from the Model Act in their requirements of the minimum period of gestation. One state is not in accord with the Model Act in either of the two criteria.

The minimum period of gestation at which registration of stillbirths is required is the more important of the two criteria in terms of the inequality of stillbirth registration in the different states. In 3 states and in New York City the minimum period of gestation required for stillbirth registration is less than 20 weeks. Five states require registration only if the fetus is advanced at least to 28 weeks of gestation. In the remainder of the states which are not in accord with the Model Vital Statistics Act, the period varies between 20 and 28 weeks.

It is to be expected that the differences in the definition of stillbirths are directly related to the relative number of stillbirths that are registered in the different states. For example, the stillbirth rate in 1940 varied from 16.4 per 1,000 total births in the State of Washington (requirement for registration—"advanced beyond the seventh month") to 49.4 in New York State (New York City requires the registration of all products of conception).

Because of this inequality in stillbirth registration, the Bureau of the Census restricts the amount of detail which it tabulates from the stillbirth certificates. It is also primarily for this reason that the Bureau of the Census bases the stillbirth rate on live births rather than on total births (live births and stillbirths) on the theory that the ratio of stillbirths to live births

* Report of the Subcommittee on Maternal, Stillbirth and Infant Mortality, of the Committee on Statistical Practice, organized in 1941.

† *A.P.H.A. Yearbook*, 1941–1942, pp. 177–178.

‡ Model Vital Statistics Act—Department of Commerce, Bureau of the Census, Washington, D. C., Mar., 1941.

NEONATAL MORTALITY AND STILLBIRTH RATES, BY STATES, AND THE MINIMUM PERIOD OF GESTATION REQUIRED FOR STILLBIRTH REGISTRATION, 1940

State	Minimum Period of Gestation	Neonatal Deaths per 1,000 Live Births	Stillbirths per 1,000 Total Births (Including Stillbirths)
Total (All States)		28.8	30.3
Minimum period of gestation in accord with Model Vital Statistics Act (At least 20 weeks)			
Total (32 States)		29.5	29.0
Alabama	Advanced to 5th month	36.7	38.4
Arizona	Advanced to 5th month	35.6	24.2
Arkansas	5th month	23.5	23.4
California	Advanced to 5th month	25.4	19.2
Colorado	5 months (20 weeks) or more	33.2	23.4
Delaware	5 months	26.8	23.4
Florida	Advanced to 5th month	33.6	40.5
Georgia	Advanced to 5th month	35.1	45.5
Illinois	Advanced to 5th month	24.1	24.9
Iowa	Advanced to 5th month	25.1	22.0
Kansas	Passed 20th week	24.1	24.1
Louisiana	5 months (20 weeks) or more	36.7	36.6
Maine	5 months or more	34.6	28.5
Michigan	Advanced to 5th month	26.5	25.3
Minnesota	Advanced to 5th month	23.4	21.0
Mississippi	5 months	30.7	46.0
Missouri	5 months	28.0	31.4
Nebraska	Advanced to 5th month	24.0	22.6
Nevada	After at least 20 weeks	30.6	18.6
North Carolina	Advanced to 5th month	33.4	33.3
North Dakota	5 months	29.1	21.8
Oklahoma	Advanced to 5th month	29.5	24.6
Oregon	After at Least 20 weeks	23.1	20.7
South Dakota	Advanced to 5th month	27.6	18.4
Tennessee	5 or more months	30.2	28.3
Texas	Advanced to 5th month	34.2	30.5
Utah	Advanced to 5th month	27.8	18.3
Vermont	5 months or over	30.6	25.2
Virginia	5 months (20 weeks) or more	34.9	35.5
West Virginia	Advanced to 5th month	31.4	34.2
Wisconsin	5th month	25.3	21.5
Wyoming	After at least 20 weeks	26.1	19.6
Minimum period of gestation less than 20 weeks			
Total (4 States)		26.9	36.6
Maryland	Any recognizable product	28.8	41.8
New York[1]	New York City—every product of conception	25.4	49.4
Ohio	At least 4½ months	26.9	25.2
Pennsylvania	4 months	28.4	27.8
Minimum period of gestation more than 20 weeks			
Total (13 States)		28.5	26.9
Connecticut	After not less than 28 weeks	25.0	19.8
District of Columbia	Passed 5th month	33.0	25.0
Idaho	Development sufficient to give chance of life	26.7	21.1
Indiana	7 months and over	26.3	22.4
Kentucky	5½ months	32.2	31.0
Massachusetts	After 5 months	25.3	26.1
Montana	6 months or 24 weeks	29.8	18.4
New Hampshire	28 weeks	24.3	24.2
New Jersey	Advanced beyond 5th month	24.2	25.4
New Mexico	5½ months	41.6	27.5
Rhode Island	6 completed months	26.2	27.5
South Carolina	22 weeks	36.5	45.0
Washington	Advanced beyond 7th month	24.6	16.4

[1] The law for New York State (Exclusive of New York City) is in accord with the Model Vital Statistics Act.

does not convey the impression of a rate which presumably measures risk.

It is difficult to evaluate the differences in the stillbirth rates of the various states in order to determine whether these differences are real and to what extent they are the results of the inequalities in the definition of stillbirth. The committee attempted to obtain at least a partial answer to this question by comparing the stillbirth rates of the various states with the neonatal mortality rates (see table). These two rates are influenced by the same general group of congenital and environmental factors. It may therefore, be expected that, by and large, the variations of the stillbirth rate in the different states would be similar to those of the neonatal mortality rate. A large excess in the variation of the stillbirth rate over that of the neonatal mortality rate would indicate the effect on the stillbirth rate of the inequalities in the provisions for the registration of stillbirths in the different states. Indeed, it is seen that generally the stillbirth rate is larger in those states in which the required period of gestation is smaller. For example, for the group of 32 states whose laws are in accord with the Vital Statistics Act the stillbirth rate is practically the same as the neonatal mortality rate; for the 4 states in which the minimum period of gestation is less than 20 weeks, the stillbirth rate is considerably higher than the neonatal mortality rate, and for the 13 states which require the registration of stillbirths only at periods of gestation of more than 20 weeks, the stillbirth rate is lower than the neonatal mortality rate. However, a comparison in the individual states between the neonatal mortality and the stillbirth rates reveals that the differences are almost as large among the 32 states which are in accord with the Model Vital Statistics Act, as among the remaining states. Moreover, with the exception of a few states which require the registration of all products of conception, the total range of variation of the stillbirth rate by state is not much different from that of the neonatal mortality rate.

The conclusion that may be drawn from this table is: (1) that we are approaching relative uniformity in the registration of stillbirths, and (2) that a large part of the inequality existing in stillbirth statistics is the result of the different legal requirements for registration. This latter may to a large extent be eliminated by different procedures in the tabulation of stillbirths.

Improvement in the comparability of stillbirth statistics in the various states may be accomplished even before all the states attain uniformity of definition. For example, only stillbirths stated to be of 20 weeks or more gestation may be included in the stillbirth tabulations. It is also possible to publish two distributions of stillbirths: one to include all those of at least 20 weeks gestation and the other to include only stillbirths of 28 or more weeks of gestation. This latter distribution would not only provide a uniform basis for comparing the stillbirth rate of the different states but would also be useful in computing the maternal mortality rate (see discussion on maternal mortality).

The subcommittee recommends:

1. That states whose laws are not in accord with the Model Vital Statistics Act make every effort to change their laws and regulations to conform with the Model Act with respect to the criteria "evidence of life" and "minimum period of gestation" and thus attain uniformity of definition in all parts of the country;

2. That until such uniformity of definition is attained the Bureau of the Census and the individual states omit from their tabulations all stillbirths stated to be of less than 20 weeks gestation;

3. That the Bureau of the Census experiment with the statement of period of gestation on the stillbirth certificates with a view of publishing an additional distribution, con-

sisting of all stillbirths of 28 weeks or more gestation;

4. That the stillbirth rate published by the Bureau of the Census and by the individual states be based on total births (live births and stillbirths) rather than on live births;

5. That the statistics on stillbirths published by the individual States contain a distribution of the stillbirths by weeks or months of gestation.

MATERNAL MORTALITY

It is common knowledge that the maternal mortality rate is not, in a statistical sense, a rate at all. It does not measure the risk of death associated with the function of reproduction, since the numerator of the fraction, the number of deaths, is much more completely specified than the denominator, the number of women exposed to the risk of dying in this way, because of the incomplete enumeration of abortions. The maternal mortality rate, therefore, always overstates the risk of death associated with the function of reproduction.

If this overstatement were of uniform magnitude in all parts of the country, and under all circumstances, it could be used as a satisfactory substitute. However, it is well known that the frequency of abortions is not uniform throughout the country. For example, it is greater in urban than in rural areas. It may be more frequent in some hospitals than in others. In evaluating public health services the maternal mortality rate is also often misleading because of the inequality in the frequency of abortion cases. For example, nursing home delivery services are restricted to periods of gestation when the offspring is viable. Again in evaluating prenatal clinic services, it must be remembered that a large proportion of the cases make their first contact with the clinic late in pregnancy and consequently are not exposed to the risk of abortion. The mortality experience in such groups cannot be compared to the usual maternal mortality rate; yet it is common practice, for lack of a better index, to use the maternal mortality rate for such purposes.

For a complete discussion of the casualties associated with pregnancy and the puerperium, it would be necessary to have, in addition to complete registration of births and stillbirths, also a detailed account of all abortions that have occurred in a given time. Such registration is of course, not feasible. It should, however, be possible to supplement the maternal mortality rate with another index, which is a fairly adequate measure of the risk of death associated with the delivery of a viable offspring. Such an index is made possible by the 1938 revision of the *International Lists of Causes of Death,* which affords a classification of puerperal deaths in four groups as follows:

1. Those associated with abortions (less than 28 weeks gestation)
2. Deaths resulting from ectopic gestation
3. Those in which death occurred without expulsion of the fetus
4. Deaths which follow the delivery of live or stillbirths (28 weeks or more gestation)

This latter group obviously is directly related to the number of women who were delivered of live or stillbirths. The ratio of deaths following the delivery of a live or a stillbirth to all women who are delivered of live or stillbirths is a measure of the risk of death associated with the delivery of a viable offspring, and is more nearly a measure of the risk of death associated with the function of reproduction than is the maternal mortality rate. It should be a useful index in connection with maternal health problems and form a uniform index suitable for comparison between various localities and different services.

This index could not and should not replace the maternal mortality rate because of the omission of a relatively large proportion of the maternal deaths,

but it can be very useful as a supplement to the maternal mortality rate.

In order to avoid confusion with the term "Maternal Mortality Rate," it has been suggested that the deaths of mothers who were delivered of a live or stillbirth related to all mothers who were delivered of live or stillbirths be referred to as "Puerperal Fatality Rate." This expression, "Puerperal Fatality," appears to have certain advantages. It has the same meaning as the usual "Case Fatality Rate" in the sense that it measures the mortality among a group of people, all of whom were exposed to a given risk. It also parallels the meaning generally applied to a case fatality rate in that it is restricted only to the length of time in which the condition or risk exists, whereas a mortality rate implies the risk of dying from any condition within a specified period of time usually expressed on the basis of a year.

There is an unfortunate discrepancy in the official definitions of abortion. The Model Vital Statistics Act as stated above, defines "stillbirth" as that of a birth after at least 20 weeks of gestation, which implies that all births of dead fetuses of 20 weeks or more gestation are stillbirths and those of less than 20 weeks gestation are abortions. In the classification of maternal deaths, on the other hand, the definition of abortion is given as of less than 28 weeks of gestation. Consequently all stillbirths between the 20 and 28 weeks of gestation are considered stillbirths by the Model Vital Statistics Act and abortion according to the *International List of Causes of Death*.

If the recommendations made above in supplementing the stillbirth rate by a tabulation of stillbirths of 28 weeks gestation and over are carried out, it would also assist in bringing into accord, at least in practical applications, the two definitions of abortion. The puerperal fatality rate may then relate the total number of deaths associated with the delivery of a live or stillbirth (28 weeks of gestation and over) to all live births plus stillbirths of 20 weeks gestation and over.

The Bureau of the Census bases the maternal mortality rate on live births. The reason, as in the case of the stillbirth rate, lies in the incompleteness of stillbirth registration. However, many states use total births as the basis for computing maternal mortality and stillbirth rates. It would appear desirable to establish uniformity also in this respect. Because stillbirth registration is improving throughout the country and especially because maternal mortality associated with the delivery of a stillbirth is very much higher than that associated with the delivery of a live birth, it appears desirable to use total births (including stillbirths), as a basis for computing maternal mortality rates.

The recommendations of the subcommittee can be summarized as follows:

1. That the maternal mortality rate be based on total births (live births and stillbirths).

2. That in addition to the maternal mortality rate the Bureau of the Census and the individual states publish also puerperal fatality rates, that is, deaths of women who are delivered of live or stillbirths (28 weeks of gestation and over), related to the total number of deliveries of live and stillbirths (28 weeks of gestation and over).

3. In view of the high correlation between survival of mother and survival of offspring, it is recommended that the individual states publish additional details on the puerperal fatality rate. It is desirable to show the rate associated with the delivery of live births separately from that associated with the delivery of stillbirths. This can be accomplished by a process of matching the maternal death certificate with that of the infant's birth or stillbirth certificate.

JACOB YERUSHALMY, PH.D., *Chairman*
EARNEST COUTURE, M.D.
JOSEPH V. DEPORTE, PH.D.
W. THURBER FALES, SC.D.
WALTER A. PLECKER, M.D.

Milk and Milk Products

(Milk, Cream, Butter, and Cheese)

Laboratory Section

THE war emergency has caused many milk control officials to make a special study of milk control procedures. Fortunately the foundations laid by the Milk and Milk Products Committee in the past have been laid so well that the methods outlined in the present Eighth Edition of *Standard Methods for the Examination of Dairy Products* have proved adaptable to all of the emergency situations that have arisen. Thanks to the survey made by Dr. Black (see *A.J.P.H.*, 33:824–832, 1943), there has been increased interest in a real standardization of laboratory technic. This is a highly desirable development.

Because the Army and Navy have practically required the use of pasteurized milk, the milk control program is becoming based even more firmly on the phosphatase test. The fact that the efficiency of pasteurization can be checked so accurately in the laboratory has lessened the necessity for actual time-consuming inspections of equipment, and methods of using equipment in pasteurizing plants. There has been difficulty because inadequately trained workers place a significance on positive findings for coliform organisms that is not justified. The preferred medium for milk testing is sodium formate ricinoleate lactose peptone broth.

The Subcommittee on the Methylene Blue Reduction and Resazurin Tests have been active during the year. Studies made under the supervision of C. A. Abele, Ch.E., Chairman, show that the variations in dye content that are found in the methylene blue tablets now on the market are not large enough to effect results significantly. Moreover, this subcommittee has recommended the establishment of a standard of approximately 9.0 mg. of dye in each 0.5 gm. tablet. This amount of dye will increase the intensity of the color slightly, but not enough to make a real change in the results secured. Dr. C. K. Johns who has studied the resazurin test reports that a 10 minute resazurin test has been adopted for official grading of market milk in Britain. However, in this case, the test is applied only to raw milk which the intake man suspects is not of satisfactory quality. Dr. Johns feels that any milk so near souring that it will cause a marked dye reduction within 10 minutes should be detectable by smell. Under such conditions, the chief value of such a test would be to confirm the intake man's suspicions. In the area covered by the A.P.H.A. this confirmation of the intake man's suspicions is more frequently carried out by making a microscopic examination, as the results secured with this technic yield more complete information regarding the past history of the milk.

The Milk and Milk Products Com-

[1] Report of the Standard Methods Committee on Milk and Milk Products.

STANDARD METHODS COMMITTEE ON EXAMINATION OF DAIRY PRODUCTS

Organized 1905. Reorganized 1933. Published reports: *Year Books*, 1934–1935, 1935–1936, 1936–1937, 1937–1938, 1938–1939, 1939–1940, 1940–1941, 1941–1942, *A.J.P.H.*, May, 1943. 8 volumes published: 1910, 1916, 1921, 1923, 1929, 1934, 1939, 1941.

Credit Lines

HOW TO FIND WHAT HEALTH EDUCATION MATERIALS YOU'RE LOOKING FOR

AT the request of the Managing Editor, the National Publicity Council for Health and Welfare Services, Inc., 130 East 22nd Street, New York 10, N. Y., has prepared an outline that will guide public health workers, especially those engaged in public health education and in health publicity, to make the best use of available channels of information. Mrs. Beatrice K. Tolleris is the guest editor for this section.

EACH year the National Publicity Council is on the receiving end of hundreds of requests for sources of ready-made health education materials. We are always glad to get them. To our way of thinking, every leaflet, motion picture, radio script or exhibit produced on a health subject is a potential asset to every agency in the field. The wider the knowledge of available material, the less duplication there will be and—even more important—the greater the amount of time, money, and skill freed for other assignments.

This does not mean that other health educators in agencies similar to your own have already turned out exhibits or leaflets which will meet your exact specifications for every conceivable occasion. Rarely will an already finished product be hand tailored to your needs. Very often, however, it will offer you a head start in the shape of valuable suggestions for an adaptation of your own.

Even the materials produced by national agencies for local imprint will probably not fill your total requirements for the year. They may, however, meet a significant proportion of your needs, releasing your time for the production of more specialized materials designed to fit a particular local situation.

How much use you make of other agencies' material depends upon your ability to find out what is available. How you ask for information is almost as important as whether you ask at all.

Assuming that you have a plan and a thought-out purpose behind your every request for a film, or exhibit, or transcription, you will get much better results if you explain that plan when you make your original request.

It is not enough, for example, to request "a leaflet on rheumatic fever." You may get an excellent pamphlet. But it might be addressed to mothers, explaining home care; it might be an explanation of the reasons behind the doctor's instructions; it might be a general discussion of the prevalence of the disease. And perhaps what you really wanted was an appeal for more hospital beds.

On the basis of our own experience, therefore, we have prepared this brief summary of the kinds of details which any agency would probably need before it could fill your requests satisfactorily.

If You Want a Leaflet

Tell us how you are going to use it. What points should it emphasize—i.e.,

prevention, early diagnosis, treatment or community action? To whom will it be distributed? How many copies will you need? Have you any special requirements as to size, cost, etc.?

If You Want a Radio Program

Do you want a script or a transcription? What are the main points it should cover? Do you want a 5 minute, 15 minute, or ½ hour program? Had you planned for a talk, an interview, a round table, or a dramatization? If you want a dramatic script, will you have the services of a professional cast and director or must it be suitable for amateur production? Will it be part of a series and, if so, what characteristics of other scripts in the series should it match? Are you willing to pay the small fee which some agencies charge for copies of their scripts?

If You Want a Film

Do you want to buy or rent it? When, where, and to whom do you plan to show it? Is your projector 16 or 35 mm., sound or silent? If we cannot find exactly what you are looking for, will you be able to use a film on a related subject and tie it to your theme with a talk? How long a film do you want?

If You Want an Exhibit

What kind of people will see it—i.e., doctors, nurses, industrial workers, school children, or the public at large? Will it be alone or part of an exposition? How much space do you have and what kind of space is it—wall space, table tops, store window? What single message do you want the exhibit to carry? If there is no borrowable exhibit which suits your purpose, have you enough time to build your own on the basis of suggestions we send you? If so, how much money do you have to spend? and can you count on the services of an artist, a photographer or both?

Whatever You Want

Tell us the " who, what, when, where, why " as you would in a newspaper release. Remember that if we are working in the dark we probably will not hit the bull's eye.

Whom to Ask

Naturally you are familiar with the resources of your own city and state health departments and of other local agencies in your community. Frequently, however, state departments and associations other than your own are willing to make their material available to you. On the national level, federal departments, voluntary agencies, and even commercial companies are a fertile source of useful material.

The partial list of national sources which follows is currently up-to-date. We have made no attempt to list specific materials offered by these sources, but in many cases catalogs are available and in most cases the name of the agency will indicate the subject matter and scope of its material.

NATIONAL SOURCES OF MATERIAL

American Medical Association, 535 North Dearborn Street, Chicago 10, Ill. Films, pamphlets, posters, exhibits, radio scripts, prepared speeches, transcriptions, catalogs, lists.

American National Red Cross, Washington 13, D. C. Films, pamphlets, posters, exhibits, radio scripts, prepared speeches, transcriptions, catalogs, lists.

American Social Hygiene Association, 1790 Broadway, New York 19, N. Y. Films, pamphlets, posters, exhibits, prepared speeches, catalogs, lists.

American Society for the Control of Cancer, 350 Madison Avenue, New York 17, N. Y. Films, pamphlets, posters, exhibits, radio scripts, prepared speeches, transcriptions.

American Society for the Hard of Hearing, 1537–35th Street, N.W., Washington, D. C. Films, pamphlets, posters, exhibits, radio scripts, prepared speeches, catalogs, lists.

Maternity Center Association, 654 Madison Avenue, New York 21, N. Y. Pamphlets, posters, exhibits, radio scripts, prepared speeches, catalogs, lists.

National Committee for Mental Hygiene, 1790 Broadway, New York 19, N. Y. Pamphlets, catalogs, lists.

National Dental Hygiene Association, 934 Shoreham Building, Washington, D. C. Films, pamphlets, posters, exhibits.

National Foundation for Infantile Paralysis, 120 Broadway, New York 5, N. Y. Films, pamphlets, catalogs, lists. Posters and exhibits in preparation.

National Organization for Public Health Nursing,

1790 Broadway, New York 19, N. Y. Pamphlets, posters, radio scripts, catalogs, lists. Film in preparation.

National Safety Council, 20 North Wacker Drive, Chicago 6, Ill. Films, pamphlets, posters, exhibits, radio scripts, prepared speeches, transcriptions, catalogs, lists.

National Society for the Prevention of Blindness, 1790 Broadway New York 19, N. Y. Films, pamphlets, posters, exhibits, radio scripts, prepared speeches, transcriptions, catalogs, lists.

National Tuberculosis Association, 1790 Broadway, New York 19, N. Y. Films, pamphlets, posters, exhibits, radio scripts, prepared speeches, transcriptions, catalogs, lists. Address requests to nearest state or local tuberculosis association.

Planned Parenthood Federation of America, 501 Madison Avenue, New York 22, N. Y. Pamphlets, posters, exhibits, radio scripts, transcriptions, catalogs, lists.

American Hospital Association, 18 East Division Street, Chicago 10, Ill. One film, pamphlets, radio scripts, prepared speeches.

U. S. Public Health Service, Washington, D. C. Films, pamphlets, posters, exhibits, radio scripts, prepared speeches, transcriptions, catalogs, lists.

Children's Bureau, U. S. Department of Labor, 14th and Constitutional Avenue, Washington 25, D. C. Films, pamphlets, posters, exhibits, catalogs, lists.

Information Division, Women's Bureau, U. S. Department of Labor, Washington, D. C. Films, pamphlets, posters, exhibits, radio scripts, prepared speeches, catalogs, lists.

John Hancock Mutual Life Insurance Company, Life Conservation Service, 197 Clarendon Street, Boston, Mass. Pamphlets, catalogs, lists.

Metropolitan Life Insurance Company, 1 Madison Avenue, New York 10, N. Y. Films, pamphlets, window exhibits, prepared speeches, catalogs, lists.

National Dairy Council, 11 North Canal Street, Chicago 6, Ill. Films, pamphlets, posters, catalogs, lists.

U. S. Chamber of Commerce, Washington, D. C. Pamphlets, films, exhibits, and posters planned for future production.

Special Sources:

American Film Center, Section on Health and Medical Films, 45 Rockefeller Plaza, New York 20, N. Y. Descriptive lists of health films with sources, prices, suitability for special audiences and a brief evaluation.

Johns Hopkins University, Department of Preventive Medicine, 615 North Wolfe Street, Baltimore, Md. Maintains lending library of health exhibits classified under these headings: nutrition, baby care, dental care, diabetes, sanitation, posture, contagion, mental hygiene, industrial hygiene, civilian safety.

Cleveland Health Museum, 8811 Euclid Avenue, Cleveland, Ohio. Films, slides, posters, exhibits on nutrition, hearing, feeblemindedness, infantile paralysis, cancer, general health, available on loan.

THE 1944 A.P.H.A. CIRCUIT OF MEETINGS IN THE WESTERN STATES

IT will be recalled that in 1943 a new pattern of meetings in western states was developed under which a team of speakers organized by the American Public Health Association, and with the coöperation of various organizations, made a circuit of 11 state and regional meetings in the West. In response to a demand from a larger number of states in 1944 it was decided to repeat this pattern and to organize a group of specially selected speakers. The officers of the Western Branch, in cooperation with the Executive Secretary of the Association, organized the following team.

Arthur Massey, C.B.E., M.D., D.P.H., Medical Officer of Health, Coventry, England

W. Ford Higby, Secretary. Western Branch, A.P.H.A., Secretary California Tuberculosis Association, San Francisco, Calif.

Chauncey D. Leake, Ph.D., Dean, University of Texas School of Medicine, Galveston, Tex.

Charles E. Lyght, M.D., Director of Health Education, National Tuberculosis Association, New York, N. Y.

Martha W. MacDonald, M.D., Psychiatric Services Adviser, U. S. Childrens Bureau, Washington, D. C.

Karl F. Meyer, M.D., Ph.D., Director, Hooper Institute, University of California, San Francisco

Ellis S. Tisdale, Sanitary Engineer, U.S.P.H.S., Washington, D. C.

Pearl McIver, R.N., Principal Public Health Nursing Consultant, U.S.P.H.S., Washington, D. C.

Henrietta Landau, R.N., Public Health Nursing Consultant, U.S.P.H.S., Denver, Colo.

William P. Shepard, M.D., San Francisco, Calif.. Metropolitan Life Insurance Company, Pacific Coast

Reginald M. Atwater, M.D., Executive Secretary, A.P.H.A., New York, N. Y.

Carl E. Buck, Dr.P.H., Field Director, Committee on Administrative Practice, A.P.H.A., New York, N. Y.

George T. Palmer, Dr.P.H., Associate Field Director, Committee on Administrative Practice, A.P.H.A., New York, N. Y.

The meetings began in early May with the sessions in Des Moines of the Iowa Public Health Association, following which the team moved to Minneapolis where the State Department of Health had invited the team's participation in the annual conference of official health workers. Then followed the meeting of the Illinois Public Health Association in Chicago, and a meeting in Madison of the public health workers of Wisconsin, where the team of speakers participated on the first day of a three day meeting. Further stops were arranged in Fargo, N. D., in Helena, Mont., where the Montana Public Health Association met, in Spokane, Wash., for the meeting of the Washington Public Health Association, in Moscow, Idaho, for the Idaho Public Health Association, and in Portland, Ore., where a newly organized Oregon Public Health Workers Association had planned a three day meeting.

Extraordinary attendance records were established in these states which made very apparent the enthusiastic welcome extended by the public health workers. They appreciated the fact that national speakers of note were brought near to the front line public health worker himself. In many cases this was the first meeting which some of the nurses, engineers, sanitarians, and the health officers had ever attended where nationally prominent participants were in attendance. The programs were organized on a teaching basis and were of the refresher course variety. Audience participation was cultivated throughout. The final Round Up sessions were lively exchanges between members of the team and members of the audience based on practical questions submitted by those in attendance.

After Portland the team moved to Sacramento for the meeting of the Northern California Public Health Association, and then to Pasadena for the Southern California group. These California workers attended to the number of about 1,000 for very enthusiastic meetings. The stop in Salt Lake City for the meeting of the Utah Public Health Association was filled particularly full for the team members who appeared three and four times each, and the meeting of the Colorado Public Health Association in Denver was similarly crowded full of lively participation and of dealing with practical problems. The members of the team were regretful that transportation difficulties made it impossible to meet with the New Mexico Public Health Association as planned, but they felt very gratified at the total attendance of more than 5,000 persons in the 13 sessions which were held among the 12 states. Already requests have been received to hold repeat performances in some of these states in 1945, but it is too early to predict whether the Executive Board of the Association will authorize a similar tour next year.

The American Public Health Association and its Western Branch are particularly grateful to the coöperating agencies which made possible the coming of these speakers, including the City Council of Coventry, England, and the British Information Services, the University of Texas, the National Tuberculosis Association, the Children's Bureau, the Hooper Institue of the University of California, the U. S. Public Health Service, the Metropolitan Life Insurance Company, and the many local groups whose coöperation enriched the program.

The central figure of the meetings of 1944 was Dr. Arthur Massey, who was selected to represent his British colleagues by the Ministry of Health of Great Britain. Dr. Massey was a splendid interpreter of current practices in Great Britain, with special reference to the emergency, to health education, and to the British pattern of medical

care as reflected in the White Paper which the British Government has submitted to Parliament.

Dr. Massey, on request, has summarized his impression of the trip as follows:

"My first impression of the United States was the skyline of New York. It exceeded my expectations, although I had expected a lot. I was struck by the geometrical pattern of the streets, for from the ship I could see the whole extent of long parallel thoroughfares. The impression was one of bold architecture and superb town planning. My subsequent few days in New York City confirmed these initial impressions. Naturally, my first reaction was in response to the lights on my first night in New York. It was a thrill to me to see a lighted city after four and a half years of complete blackout.

"I was told that our tour would be a grueling one. But its strenuous nature was more than offset by its congeniality. It is a gamble to bring a party of people together to spend some weeks traveling around as a team; but I was early reassured because there was complete compatibility with and between all members of the party. We were fortunate in that our first meeting at Des Moines was a highly successful one at which we received most cordial treatment at the hands of Dr. Walter Bierring, who is a master in the art of hospitality. Iowa set a high standard which was maintained throughout the tour, and I feel personally indebted to all the responsible officers at each meeting place for their unfailing courtesies and unremitting help.

"A first visit to a great country like the United States is a memorable experience, especially in view of the wide geographical variations state by state which give one a constantly changing chain of impressions. The latter tend to divide themselves into compartments according to geography. In the Middle West I saw two extremes, from the immensity and sophistication of Chicago to the sparseness and romance of the ranch lands of North Dakota and Montana. In between were the rich agricultural terrains of Minnesota and Wisconsin. Then I have vivid impressions of the Columbia River Country, joining Washington State, Idaho, and Oregon. California I place in a category alone and the word will always conjure up in my mind a picture of the blue Pacific Coast, sub-tropical fruits, redwood trees, and film stars. All these I saw during my visit and I was nowhere disappointed. I especially recall a certain recherché luncheon in San Francisco given in my honor by Dr. Karl Meyer.

"Having crossed the arid Mojave Desert, I felt the great contrast between it and the freshness and hospitality of Salt Lake City. The final call at Denver I associate with the scenic Rocky Mountains of Colorado and with a motor trip to the heights and with an excellent weekend's trout fishing. A certain club dinner given by Dr. Fred Foard is one of many happy landmarks.

"I am not sure that I ought to have mentioned any specific occasions of the tour because all the trip was similarly enjoyable. It was due to the generosity of the organizing officers at each stop and to the congenial company provided by members of the team. All of these it is my privilege to regard as permanent friends. I can only hope that if a team is formed for a tour next year they will be as thoroughly happy together as we have been this year.

"I feel that the members of the team were most amused at my obvious enjoyment of vanilla ice cream twice daily and of my breakfast of bacon and two eggs each morning. These are great treats to one from Great Britain nowadays!

"At the end of the tour I was convinced that the team had done a considerable service at the various state

health meetings by imparting up-to-date knowledge, and above all by submitting eagerly to the barrage of questions which everywhere characterized the 'round up' sessions. At every meeting we taught and learned.

"I am looking forward to telling Sir Wilson Jameson (Chief Medical Officer, Ministry of Health, England) of the excellent experiences I have had, and of thanking him and also the Coventry City Council for the opportunity they gave me for visiting a great and progressive country.

"My final word is one of very cordial thanks to the American Public Health Association and to the Secretary, Dr. Atwater, for making these arrangements possible and for their wonderful treatment of their guest from England."

BOOKS AND REPORTS

All reviews are prepared on invitation. Unsolicited reviews cannot be accepted.

Clinical Tropical Medicine—*Edited by Z. Taylor Bercovitz. New York: Hoeber*, 1944. 957 pp. Price, $14.00.

This new textbook of tropical medicine has been prepared with the cooperation of twenty-seven contributors, including the editor. In this method of preparation the book differs from the other recent textbooks of tropical medicine in the English language. The contributors are all among the best authorities in their respective fields, and some of the sections are the best that the reviewer has seen in textbook form. Each contributor has apparently been given a wide latitude in presentation, although each disease is considered under the usual textbook headings.

Among the most valuable sections are those on the diseases caused by Rickettsiae by Henry Pinkerton, those covering pinta and yaws by Howard Fox, yellow fever by Fred L. Soper, psittacosis by K. F. Meyer, tularemia by Lee Foshay, undulant fever by A. V. Hardy, leprosy by George W. McCoy, nutritional diseases by Edward B. Vedder, and mycotic diseases by Morris Moore. A few of the sections are rather superficial in presentation and are poorly organized, such as the section on diarrheal diseases, where some of the intestinal protozoa are presented in more than one place, and the classification of all of the intestinal flagellates is given under giardiasis after the individual members of the group have been presented in the previous chapter. In the chapter on bacillary dysentery, the bacteriology of the disease has received insufficient attention and, under treatment, polyvalent antiserum is given a prominent place without reference to type of organism involved.

The chapter on arthropods is limited to those injuring man and does not relate them sufficiently to the transmission of diseases. Unfortunately, this section was not prepared by a medical entomologist.

The illustrations are numerous and excellent. Many of them have been borrowed from other standard works, such as Dobell's *Monograph on the Intestinal Portozoa* and Wenyon's *Protozoology*. Many others are original, those in the section on mycoses being particularly good. The book is published in excellent style and is unusually free from typographical errors One only wishes that such textbooks could be printed on paper which would make the volume easier to handle. It will prove to be a valuable reference book for medical students, instructors, public health departments, and physicians who are interested in tropical medicine, but it should be supplemented by other modern textbooks.

HENRY E. MELENEY

The Youngest of the Family—His Care and Training—*By Joseph Garland, M.D. (rev. ed.). Cambridge, Mass.: Harvard University Press*, 1943. 182 pp. Price, $2.00.

This is a new edition of another of the many books written to help mothers raise babies. It contains a good discussion of the variations in growth and development commonly observed in children, and calls for a common sense attitude toward clothing. In general, the approach is one of tolerance and understanding, but there will be considerable disagreement with the author's advice on very early toilet training.

Insistence on breast milk for prema-

ture infants seems hardly justified when there is so much evidence that other milks may be at least as satisfactory.

MYRON E. WEGMAN

Pathology and Therapy of Rheumatic Fever—*By Leopold Lichtwitz. New York: Grune & Stratton,* 1944. 198 pp. Price, $4.75.

Dr. Lichtwitz's book is based on the thesis that rheumatic fever is an allergic disease. In order to develop this theory, experimentally proven facts are intermixed with clinical impressions and rules of thumb. The discussion of the relationship of the central nervous system to the allergic theory of acute rheumatic fever is particularly obscure. Although this theory may finally prove to be correct, the case for it has not been clearly made in this volume.

The text of the book is not limited to rheumatic fever but to rheumatic manifestations of many diseases. There is a constant intermingling of statistics and facts relating to various types of rheumatic disease so that, even for one somewhat familiar with the literature, it is difficult to follow the argument. For those interested in theorizing discussions of rheumatic fever, the reading of the early chapters of this book may provide the framework on which experimental studies may be designed. It is of interest that in this book on rheumatic fever, even in the discussion of prognosis, the words "sub-acute bacterial endocarditis" never appear. This book is definitely not designed for the general practitioner.

The charming foreword by William J. Maloney makes excellent reading.

DAVID D. RUTSTEIN

War and Children — *By Anna Freud and Dorothy T. Burlingham. New York: International University Press,* 1943. 191 pp. Price, $2.00.

This small book was written primarily for American parents but it has a message for a much wider audience, among parents of all countries as well as professional workers in public health, medicine, education, and psychology. The authors are pioneers in nursery school work, Anna Freud being the daughter of Sigmund Freud who introduced psychoanalysis, while Dorothy T. Burlingham is an American psychologist. Both have long been interested in the psychological development of children and have fostered the development of facilities wherein are provided proper emotional relationships for the child.

The war brought the authors to England where they established three nursery schools which differ greatly from the customary peacetime nursery schools or day nurseries of the Continent and the United States, and which resemble more a kind of foster home.

The book is written simply and clearly, and has excellent illustrations. It is divided into two main divisions; part one deals with such things as the psychological reactions of the child to destruction, air raids, evacuations, and separation from parents, and formulates practical methods of dealing with the behavior set-off by these traumatic influences; part two is made up of reports and case records of individual children and gives in detail the reactions which are discussed more generally in the preceding part; there is included an outline, with some discussion, of the training courses for young women who work in the nurseries.

The book not only provides facts which are of interest in terms of psychological reactions of children to unusual trauma but points out clearly the relationship between emotional maladjustment and the home life in the first five years of life. This book then becomes a primer of child care in peacetime as well as a record of the disastrous influence of war.

MILTON J. E. SENN

A Survey of Alcohol Education in Elementary and High Schools in the United States—*By Anne Roe, Ph.D. New Haven, Conn.: Quarterly Journal of Studies on Alcohol,* 1943. 132 pp. Price, $1.00.

For a long time many of us have suspected that something was definitely wrong with teaching practices and teaching materials in alcohol education. Fortunately Dr. Roe has performed a most successful "exploratory operation" on the "subject" of alcohol education as it is now presented through the medium of health education textbooks prepared especially for use by children and by adolescents in public, private and parochial schools throughout the United States. One hundred and sixty-six books and publications, including 137 textbooks, were explored. Current teaching practices and teaching materials are tabulated systematically, and are discussed critically from the standpoint of scientific validity and pedagogic caliber.

Dr. Roe's "operative" findings disclose that a considerable portion of the material about alcohol knowledge in these textbooks is scientifically invalid. Many of the writers display a tendency to vagueness of terms, and indiscriminate generalizations. These same authors frequently present material without foundation of scientific fact, especially when speaking of alcohol as a habit-forming drug, a poison or narcotic, when describing the effects of alcohol on nutrition, on resistance to disease, on heredity and longevity, and when including statistics concerning alcohol as a direct or contributory cause of disease. One of the chief faults to be found with discussions on alcohol as a poison or narcotic, is the complete disregard in nearly all of the textbooks of the distinction between the effects of drinking small amounts of alcohol and of excessive drinking. Authors rarely keep this distinction clear. Instead, they seek to espouse the cause of total abstinence rather than to present the known facts about alcohol and its effects.

The latter half of the book deals with the legal regulations of alcohol education and analyzes those laws of the states which make mandatory the inclusion of alcohol education in the school curricula. There is an excellent list of standard references, an exhaustive bibliography of textbooks which the author reviewed in her searching analysis of alcohol education, and a bibliography of state laws on alcohol education. Members of committees on health education textbooks and authors of such books will find it to their advantage to read this volume.

I. H. GOLDBERGER

Manual of Industrial Nutrition. 25 pp.

Planning Meals for Industrial Workers. 28 pp.—*By Food Distribution Administration, Nutrition and Food Conservation Branch, U. S. Department of Agriculture. Washington, D. C.: U. S. Govt. Ptg. Off.,* 1943.

The Food Distribution Administration of the U. S. Department of Agriculture has issued these two pamphlets as the first of a series designed to aid in the program of raising the nutritional status of the vast numbers of workers engaged in American industry. In the preparation of these brief manuals the Nutrition in Industry Division of the Nutrition and Food Conservation Branch has rendered a valuable service by concisely presenting how any industrial plant or community may undertake the protection or obtain advice on how to protect the health of industrial workers through good nutrition.

The *Manual of Industrial Nutrition* provides an excellent outline of the job to be done and the technics which are proving successful in meeting a long-

time need greatly aggravated by wartime industrial conditions. It is worthy of comment that attention is given not only to what can be accomplished by a sound nutrition program but also to factual refutation of some of the claims that a single or multivitamin preparation will provide an answer to all industrial medical problems.

The second pamphlet, *Planning Meals for Industrial Workers,* should prove useful to those responsible for the actual planning and supervision of meals. THOMAS D. DUBLIN

Physical Fitness Through Health Education for the Victory Corps, 1943. 98 pp. Price, $.20.

Handbook on Physical Fitness: For Students in Colleges and Universities, 1943. 140 pp. Price, $.25—*Prepared by a committee appointed by the U. S. Commissioner of Education with the collaboration of the U. S. Army, the U. S. Navy, the U. S. Public Health Service, and the Physical Fitness Division of Defense Health and Welfare Services. Washington: Supt. of Documents, U. S. Govt. Ptg. Off.*

These manuals are approved by the representatives of the Army, Navy, U. S. Public Health Service, and U. S. Office of Education. Representative and well qualified persons, including teachers of physical education, health education experts, medical and other specialists, served as special committees to prepare the manuals.

There can be no doubt that physical education and health education in secondary schools, colleges and universities have been advanced greatly during the war, and that the initial stimulus came from manuals such as these, developed by the various departments of the federal government. The urgency of the war effort has broken down departmental lines. Physical fitness is being stressed even at the expense of other studies and practices. Directors, principals, classroom teachers, physical education teachers, school physicians, and nurses, health department health services, and numerous voluntary agencies, are now working together as never before in the efforts to find physical and dental defects and have them corrected, to prevent and control communicable diseases, improve nutrition, physical fitness and endurance.

These manuals suggest methods and technics for action as well as giving specific advice and information.

The first manual, *Physical Fitness Through Health Education for the Victory Corps* provides six objectives as a basis for a wartime emergency program on health education in high schools. These include: (1) correction of remediable defects; (2) prevention and control of communicable diseases; (3) improvement in nutrition; (4) prevention of accidents and training to assist in giving emergency care; (5) daily program planning for balanced living; and (6) development of sound mental attitudes.

The *Handbook on Physical Fitness for Students in Colleges and Universities* seems also to have met a decided need. From physical education experts with whom the reviewer consulted, he learns that for men, the manual contains excellent material which can be elaborated and expanded according to facilities available. It provides a well rounded program and counteracts the over-stressing of intramural and intercollegiate sports. For women, the all-round program suggested has been received as sound and useful. The chief complaint seems to be that in many colleges and universities, the time and the personnel available are insufficient adequately to carry out the suggested program.

John W. Studebaker, U. S. Commissioner of Education, states:

In light of contemporary developments, it

has become increasingly apparent that our colleges and universities can perform no greater service at this time than to provide programs and facilities through which their students may become physically fit. Physical fitness may mean the difference between life and death for men entering the armed forces. Physical fitness is also of utmost importance to men and women who participate in industrial and agricultural programs.

This manual points out with authoritative information how to reach the above ends. CARL A. WILZBACH

A Hundred Years of Medicine—*By C. D. Haagensen and Wyndham E. B. Lloyd. New York: Sheridan House,* 1943. 444 pp. Price, $3.75.

This American edition of a series of essays on the history of modern medicine (which has also appeared in an English edition) is another of the many attempts in recent years to popularize the subject. This one has some advantages for the public health worker, for it touches on subjects of interest to him which many others do not, as, for example, the sanitary conditions and the state of hospitals in the 1800's, as well as the social aspects of medicine as seen today. But, in general, the story is that of the developments of chemotherapy and anesthesia, the conquest of various diseases, the rise of certain specialties (neurosurgery, orthopedics), the use of radium and vitamins, etc. The authors have done well in tracing chronologically the development of their separate topics. The story is told, however, in a style that left this reader less than convinced that it would satisfy either the layman or the expert. The confusion seems due to a mixture of technical and everyday language and to the hodge podge of biographical anecdote and anatomic, bacteriologic, or clinical background which adorn the tale. In view of the many new subjects discussed, it is surprising that those of air sterilization and the relationship of jungle fever to yellow fever control were omitted. Despite these shortcomings, the volume does contain a substantial amount of accurate information on the developments in medicine in the past one hundred years.

LEONA BAUMGARTNER

Nutrition Reviews. *Vol. 1, Nos. 1–14. November, 1942–December,* 1943. *New York: Nutrition Foundation,* 1944. 443 pp. Price, $2.00, Domestic subscription; $2.50, Foreign.

If any further proof of the tremendous expansion of the field of nutrition were needed, it might be found in these more than 400 pages of abstracts covering 14 issues of this monthly publication of the Nutrition Foundation, New York, N. Y. A critical review of the contents would be as difficult as reviewing the encyclopedia. One must recognize, however, the compentence of the staff of reviewers and be grateful for this public service of the Nutrition Foundation. For succinct and yet comprehensive presentation of the literature, this volume has few equals.

REGINALD M. ATWATER

Physical Fitness for Girls: *Contributions of Physical Education to War-Peace Programs in Secondary Schools—By Rosalind Cassidy, Ed.D., and Hilda Clute Kozman, Ph.D. New York: Barnes,* 1943. 223 pp. Price, $2.00.

Fitness First: *A Physical Fitness Workbook for High School Girls—By Hilda Clute Kozman and Rosalind Cassidy. New York: Barnes,* 1943. 32 pp. Price, $.60.

These books have been written to enable schools to meet the immediate wartime demands on secondary instruction, but present a program so practical and a philosophy so appealing that their usefulness will extend far beyond

the "duration" into the years when peace and security are once more taken for granted by education. The textbook is designed specifically for college students who are preparing to be teachers of girls in the high school physical education program. This is not, however, an inclusive text; its "materials and methods are delimited to those thought suitable for building understandings and skills in endurance, strength, body control, relaxation and morale in an orientation course" (p. 45). The authors state plainly that they do not advocate discarding the valuable program already established in girls' physical education, even though they make no attempt to describe this in detail. It is important for the reader to have this limitation clearly in mind; otherwise the plan presented will seem narrow and somewhat poverty-stricken, in comparison to the wealth of activities, goals, and materials characteristic of modern physical education.

To "redirect emphasis to elements of physical fitness that have always been important for the physical education teacher," the authors suggest an orientation course, given first for all girls in the school, later for new girls and for those who can profit by its repetition. The assumption is that graduates from the orientation program will go on to such activities as sports, dancing, etc., now characteristic of secondary school offerings. The book offers a way of meeting the urgent wartime demand for revising present-day programs, without returning to gymnastic regimentation and autocratic response-command systems. "The disciplines of democracy are self-discipline, self-control and self-direction . . . in coöperation with others for the common good" (p. 40). In a time when there is thoughtless acceptance of "commando" training as proper activity for young girls in school and college, it is more important than generally realized to have such a book as this, which Lindeman in his Preface felicitously describes as "both an antidote for the wrong type of physical education for young girls and a straightforward, usable plan for something better" (p. V).

School health officers, both physicians and nurses, will find encouragement and appreciation of their services in this teacher training text; and they will not find themselves embarrassed by careless statements or naïve enthusiasms. Experience, reflection, wisdom, as well as specialized knowledge and competence, have gone into the making of these books.

EDNA W. BAILEY

Manual for Water Works Operators—*By the Texas Water Works Short School. (rev. ed.) Austin: Texas Water Works Short School,* 1943. 392 pp. Price, $3.00.

This represents a condensed reference work on the operation of public water supply systems. It is a useful volume for all local water supply officials, although intended primarily for those of Texas. The revised edition adds 106 pages and new features to the first edition of 1938. The Drinking Water Standards of the U. S. Public Health Service and the associated manual are reprinted as an appendix.

Twenty-three authors have contributed a series of chapters upon sources and protection of water supply, pumping, metering, treatment (7 chapters), distribution system maintenance, storage, industrial water supplies and the requirements of several Texas State Departments pertaining to water supplies. Several appendicies and a comprehensive index complete the volume.

Within the scope of a condensed reference work much information is given as to all aspects of the opera-

tion of public water supplies. The volume will be of chief value to those desiring a fundamental knowledge as to the general field of operation rather than to specialists interested in the restricted aspects of water supply or water purification plant operation.

As might be expected with a text prepared by so many authors, there is a certain lack of functional coördination in the discussion of several aspects of water quality and the related processes of water treatment. Thus one finds disconnected portions of the text dealing with different aspects of the same general subject, such as water chlorination. Occasionally the text overemphasizes certain technical details at the expense of operating details. For instance, Chapter XII entitled "Algae and Water Supplies" presents in a useful form the biology of aquatic vegetation, but contains only one short paragraph on methods of application of copper sulfate for algae control, and no mention is made as to the practical aspects of collecting representative samples for microscopical examination to enable control procedures to be intelligently utilized.

In a similar way the discussion of the chlorination of water makes no mention of the effects of water temperature, pH, available period of contact before the treated water is delivered to the first consumer, nor of the practical use of the orthotolidine test in compensating for such influences. Furthermore, no mention is made in the directions for the orthotolidine test of errors due to nitrate, manganese, color, turbidity, etc.

The chapter on bacteriological examination of water represents a popular review of the standard laboratory procedures but presents no background as to general water bacteriology nor as to the interpretation of the results of the examinations in terms of purification plant and water supply control.

Notwithstanding these and similar deficiencies, the revised edition of this book represents a convenient reference work as to all aspects of public water supply operation which should be of greatest assistance to those desiring general information upon those aspects of water supply operation which are foreign to their experience.

C. R. Cox

Red Cross Home Nursing—*By Lona L. Trott, R.N. B.S., School Edition edited by Gertrude E. Cromwell, R.N., M.S.* Illus. Philadelphia: Blakiston, 1943. 363 pp. Price, $1.00, cloth, $.60 paper.

This book has been especially prepared for use with senior high school students. Much of the material was adapted from the former *American Red Cross Textbook on Home Nursing.* New and revised material on general health is included in the chapters (Section 1) on "Personal Readiness to Meet Everyday Problems." The presentation of the subject matter in the other three sections *i.e.,* When Sickness Invades the Home, Understanding Child Growth and Development, and Protecting the Health of Our Homes and Community, should appeal to 11th and 12th grade students.

The presentation in Section 1 may be found too elementary for the present-day high school age group.

Drawings and photographs are effectively used to illustrate many of the simple nursing technics.

Teachers of Red Cross home nursing courses in high school should welcome this long overdue textbook.

LULU ST. CLAIR BLAINE

Handbook for Use of Instructors and Administrators — *Red Cross Home Nursing, School Edition, American Red Cross, Washington, D. C.,* June, 1943. 54 pp.

The new and the experienced teacher

should find this handbook useful in planning for and carrying out a home nursing instruction program in senior high schools. It was designed to be used in conjunction with the textbook *Red Cross Home Nursing*. How to organize classes and to fit the course into the school program is outlined. Materials needed for the course are listed. Suggestions for use of the materials are offered, as well as a reading list for the instructor. This handbook should be indispensable to any instructor of home nursing.

LULU ST. CLAIR BLAINE

Handbook for the Etiology, Diagnosis and Control of Infectious Bovine Mastitis—*By Ival Arthur Merchand and R. Allen Packer. Minneapolis: Burgess Publishing Co.,* 1943. 66 pp. Price, $1.25.

This handbook has been prepared for students from lecture notes and field experience. It is also valuable for the practising veterinarian as it contains concentrated, up-to-date information concerning this important disease. Various chapters discuss the predisposing factors, the bacteriology of mastitis, and the diagnosis, control, and treatment of the disease. The disappointing feature of this summary, as must be the case with all summaries of our present knowledge, is that no adequate cure, control, or eradication program can be presented for this wasteful scourge.

ROBERT S. BREED

Brucellosis in Man and Animals—*By I. Forest Huddleson. (rev. ed.). New York: Commonwealth,* 1943. 379 pp. Price, $3.50.

Economically, and considering occurrence and duration of infection, Brucellosis now assumes first place among diseases transmissible from animals to man. It is fitting and fortunate that this book should have as its author a veterinarian, an investigator recognized internationally as an authority on this subject.

Seven Chapters are arranged as follows: I—The Genus Brucella, II—Methods of Isolating Brucella, III—Differentiation of the Species of the Genus Brucella, IV—Brucellosis in Human Beings, V—Brucellosis in Animals, VI—Laboratory Diagnosis of Brucellosis, and VII—Eradication or Control of Sources of Brucella Infection.

In Chapter IV, Part Two, "Brucellosis in the United States," was contributed by A. V. Hardy, M.D., Consultant U. S. Public Health Service, and Part Three, "Brucellosis in Malta," by J. E. Debono, M.D., of the Royal University of Malta. Chapter VII and the Preface were written by Ward Giltner, D.V.M., Dean of the Veterinary Division of Michigan State College.

This book embodies a wealth of information pertaining to symptomatology, diagnosis, and methods of treatment (sulfatherapy, brucellin, artificial fever therapy), and will prove a valuable guide to physicians. The volume is essential to bacteriologists and laboratory workers, whose interest is the study of brucella, its isolation, species differentiation, and laboratory diagnosis. Veterinarians, livestock sanitarians, and public health administrators will learn much from this book about Brucellosis in animals, including the present status of calfhood vaccination with strain No. 19.

The treatise incorporates an appendix of case reports, a bibliography with 485 references, significant historical high lights, and a stimulus which will lead to further knowledge, more effective control, and prevention of an important but partly known communicable disease.

CARL F. JORDAN

A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

RAYMOND S. PATTERSON, PH.D.

Outspoken Reporting — Gordon Bates tells of an increase in syphilis in his city, and, what is more disturbing, an increase in recently acquired syphilis. He found this out by asking the doctors, as he does from time to time.

BATES, G., A Survey of the Incidence of Venereal Diseases in Toronto in 1943. Canad. Pub. Health J. 35, 6:234 (June), 1944.

Where Polio Struck—If in nothing else, you will be interested in the map showing the nation-wide distribution of poliomyelitis in 1943. In the discussion of the behavior of this disease, it is pointed out that neither differences in climate, geography, density of population, nor racial characteristics seem to be factors of importance in accounting for variations in numbers of outbreaks.

DAUER, C. C. Prevalence of Poliomyelitis in the United States in 1943. Pub. Health Rep. 59, 22:712 (June 2), 1944.

Rheumatic Fever in England— "Rheumatism may lick the joints, especially in childhood, but it bites the heart." Nice aphorism, isn't it? The paper, otherwise, is good, too.

DONOVAN, G. E. Some Aspects of Cardiovascular Disease With Special Reference to Public Health. Pub. Health. 57, 8:85 (May), 1944.

Good Works — Wholesomely frank is this review of how little we really know about poliomyelitis. The activities of the National Foundation in supporting research, training physicians, nurses and technicians—1,300 since 1942—and disseminating information are recounted with a pleasing absence of self-administered back-patting.

FISCHOFF, E., and GUDAKUNST, D. W. The Fight against Infantile Paralysis Continues. Am. J. Nurs. 44, 6:533 (June), 1944.

The Professors Look at Kenny— After pulling the wobblier of the props out from under some of Sister Kenny's overenthusiastic claims for her method, this committee admits, a little grudgingly, that her contentiousness "has stimulated the medical profession to reëvaluate known methods of treatment." For that understatement the eminent professors should be awarded the big brown derby!

GHORMLEY, R. K., *et al.* Evaluation of the Kenny Treatment of Infantile Paralysis. Report of Committee. J.A.M.A. 125, 7:466 (June 17), 1944.

Papers-of-the-Month — Whether you sit behind an executive's desk, or before a laboratory table, or visit homes, or inspect food handling establishments, you should read this symposium on "The Treatment of Burns." As one of the writers says "much controversial matter appears to have been settled," and you owe it to yourself to be informed about the settlement. So you'll find no superficial abstracting done here. There will be seven papers in all: read all seven.

HARKINS, H. N. The Problem of Thermal Burns (and six related papers). J.A.M.A., 125, 8:533 (June 24), 1944.

For Venereal Patients Who Can Pay—Every health administrator will be interested in this straightforward account of an effort to increase the proportion of venereal patients treated by practising physicians in Philadelphia. The program did materially improve the previously tragic picture and the method might find applications in the epidemiology of other diseases.

INGRAHAM, N. R., and GREENBAUM, S. S. Public Health Venereal Disease Control. J.A.M.A., 125, 8:527 (June 24), 1944.

For Your Soul's Good—Unless we who work in health . . . are ourselves free from prejudice and intolerance, we cannot hope to work with full effectiveness, says this fellow, who takes intolerance apart to see " what makes it tick."

KILPATRICK, W. H. Applied Democracy in Inter-Group Relationships. Pub. Health Nurs. 36. 6:265 (June), 1944.

" Who Owns Health? "—We learn from the President of the A.M.A. that venereal diseases are almost completely controlled; that pneumonia is no longer a danger; that cerebrospinal meningitis mortality is now about 5 per cent; that the local medical profession will readily take care of whatever pellagra is found; that as a result of the wonderful achievements of medicine the life span has increased from 40 to 65 years; that army doctors wonder what they are fighting for; that under our present system of medical practice the people of this country have enjoyed the best health record of any nation on earth.

KRETSCHMER, H. L. American Medicine and the War. J.A.M.A. 125, 7:461 (June 17), 1944.

Next-Steps-in-Science Department—It seems that when suspensions of bacteria or viruses are allowed to flow in a ribbon-like stream past a new type of ultra-violet lamp they are rapidly inactivated, and with a minimum loss of antigenicity. This paper tells about the results of such treatment on colon, typhoid, and certain salmonella, streptococcus and pneumococcus cultures. Rabies and encephalitis vaccines treated in this way induced a high degree of immunity in mice.

LEVINSON, S. O., *et al.* Production of Potent Inactivated Vaccines with Ultra-violet Irradiation. J.A.M.A. 125, 8:531 (June 24), 1944.

Medical Care for All Canadians—That all the known health measures conducive to the prevention and control of illness should be made available to all people is axiomatic, says the Minister of Pensions and National Health. The solution of the problem of the provision of adequate medical care lies in health insurance, he adds. Rugged individualists hereabouts will disagree with his extension of these introductory remarks.

MACKENZIE, I. A. Health Insurance. Canad. Pub. Health J. 35. 6.213 (June), 1944.

About Beautiful Ideas That Turn Sour—A successful boomerang is something you throw into the air and which hits you in the back of the neck if you don't watch out. As a great many health publicity ventures seem to turn into that kind of boomerang, every administrator with a yen for health education, will profit by reading this excellent dissertation. Incidentally, this is but one among many such stimulating papers that have appeared recently in *Channels* only to be ignored in this bibliography. To the able editors of *Channels* go my abject apologies for this neglect.

MERTON, R. K., and KENDALL, P. L. The Boomerang Response. Channels. 21, 7:1 (June). 1944.

" Telling All " to High Schoolers—Reporting upon a two year experience with the group-discussion method of venereal disease education (for high school youngsters) in which men and women speakers furnished by the divisional health department lead the discussions. Integration of social hygiene in the science units may be a preferred method, but this one works too, is the claim of these Canadian writers.

RHODES, H. C., and CAPELLE, P. M. C. Venereal-Disease Education in the High School. Canad. Pub. Health J. 35, 5:181 (May), 1944.

Despite Ecclesiastes 1:8—Not to be confused with infections mononucleosis, is still a newer disease—acute infectious lymphocytosis — which threatens to add to the epidemiological troubles of the public health fraternity. As it is a communicable condition, with upper respiratory symptoms most frequently featured, epidemiologists had better acquaint themselves with the differential diagnosis discussed in this paper. Still another virus is suspected.

SMITH, C. H. Acute Infectious Lymphocytosis: A Specific Infection. J.A.M.A. 125, 5:342 (June 3), 1944.

Moses Was a Shrewd One—Exposure to trichinosis infestation is nearly uniform regardless of geographical or environmental factors. Evidence in hand points to the need for nation-wide preventive action.

WRIGHT, W. H., and WALTON, A. C. Studies in Trichinosis. Pub. Health Rep. 59, 21:669 (May 26), 1944.

BOOKS RECEIVED

MEDICAL EDUCATION IN THE UNITED STATES BEFORE THE CIVIL WAR. By William Frederick Norwood. Philadelphia: University of Pennsylvania Press, 1944. 487 pp. Price, $6.00.

PSYCHIATRY AND THE WAR. Edited by Frank J. Sladen. Springfield, Ill.: Thomas, 1943. 464 pp. Price, $5.00.

PRACTICAL MALARIA CONTROL. A Handbook for Field Workers. By Carl E. M. Gunther. New York: Philosophical Library, 1944. 91 pp. Price, $2.50.

VIRUS DISEASES IN MAN, ANIMAL AND PLANT. By Gustav Seiffert. New York: Philosophical Library, 1944. 332 pp. Price, $5.00.

THE PATHOGENESIS OF TUBERCULOSIS. By Arnold R. Rich. Springfield, Ill.: Thomas, 1944. 1008 pp. Includes 35 page index, 89 figures, 20 tables, 1417 references, 4 charts. Price, $10.50.

ARTIFICIAL PNEUMOTHORAX IN PULMONARY TUBERCULOSIS. Including Its Relationship to the Broader Aspects of Collapse Therapy. By T. N. Rafferty. Illus. New York: Grune & Stratton, 1944. 192 pp. Price, $4.00.

THE ELECTROCARDIOGRAM. ITS INTERPRETATION AND CLINICAL APPLICATION. By Louis H. Sigler. Illus. New York: Grune & Stratton, 1944. 403 pp. Price, $7.50.

THE PUBLIC HEALTH NURSE IN THE COMMUNITY. By Clara B. Rue. Philadelphia: Saunders, 1944. 283 pp. Price, $2.50.

ELIMINATION DIETS AND THE PATIENT'S ALLERGIES. A Handbook of Allergy. By Albert H. Rowe. 2nd ed. thoroughly revised. Philadelphia: Lea & Febiger, 1944. 256 pp. Price, $3.50.

FOOD ENOUGH. By John D. Black. Lancaster, Pa.: The Jacques Cattell Press, 1943. 269 pp. Price, $2.50.

THE U.S.S.R. IN RECONSTRUCTION. A Collection of Essays. By The American Russian Institute. New York: The American Russian Institute, Inc., 1944. 160 pp. Price, $1.00.

PRINCIPLES AND PRACTICES OF INHALATIONAL THERAPY. By Alvan L. Barach. 59 Illus. Philadelphia: Lippincott, 1944. 315 pp. Price, $4.00.

HOUSING YEARBOOK, 1944. Chicago: National Association of Housing Officials, 1944. Publication No. N191. 176 pp. Price, $3.00.

INTERNATIONAL RELIEF IN ACTION, 1914–1943. Selected Records, with Notes. By Hertha Kraus. Philadelphia: American Friends Service Committee, 1944. 248 pp. Price, $1.25, cloth ed.; $1.00 paper ed.

POLIOMYELITIS. By Edward C. Rosenow. New York: The International Bulletin. Vol. A44, 1944. 87 pp.

INSTITUTIONS SERVING CHILDREN. By Howard W. Hopkirk. New York: Russell Sage Foundation, 1944. 244 pp. Price, $2.00.

UNDERSTANDING THE YOUNG CHILD. By W. E. Blatz. New York: Morrow, 1944. 278 pp. Price, $2.50.

BUILDING A POPULAR MOVEMENT. A Case Study of the Public Relations of the Boy Scouts of America. By Harold P. Levy. New York: Russell Sage Foundation, 1944. 165 pp. Price, $1.25.

ASSOCIATION NEWS

SECOND WARTIME PUBLIC HEALTH CONFERENCE AND
SEVENTY-THIRD ANNUAL BUSINESS MEETING
AMERICAN PUBLIC HEALTH ASSOCIATION
New York, N. Y., October 3–5, 1944
Headquarters: Hotel Pennsylvania

RATES QUOTED BY NEW YORK HOTELS

Second Wartime Public Health Conference and Seventy-third Annual Business Meeting—October 3–5, 1944

	Rooms Without Bath		*Rooms With Bath*	
	Single	*Double*	*Single*	*Double*
Headquarters:				
Pennsylvania, 7th Ave. & 33rd St.			$3.85– 6.60	$5.50– 8.80
Hotels near Hotel Pennsylvania:				
Governor Clinton, 7th Ave. & 31st St.			3.30– 5.50	4.40– 7.70
Martinique, Broadway & 32nd St.	$2.00–2.50	$3.00–4.00	2.75– 3.85	3.85– 5.95
McAlpin, Broadway & 34th St.	2.20–2.75	3.85–4.40	3.30– 6.60	4.95– 8.80
New Yorker, 8th Ave. & 34th St.			3.85– 8.80	5.50–11.00
Allerton House, 143 East 39th St.	2.00–2.25		2.75– 3.00	
Allerton House for Women, 130 East 57th St.	2.00–2.50		3.00– 3.50	
Ambassador, Park Ave. & 51st St.			6.00– 8.00	$8.00–10.00
Astor, Broadway & 44th St.			3.50– 5.00	6.00– 8.00
Barbizon (Women), Lexington Ave. & 63rd St.	2.00–2.75	3.50–4.50	3.25– 3.75	4.50– 5.50
Barclay, 111 East 48th St.			6.00– 7.00	8.00–10.00
Belmont Plaza, Lexington Ave. & 49th St.			4.00– 5.50	6.00– 8.00
Beverly, Lexington Ave. & 50th St.			5.00– 6.00	7.00– 8.00
Biltmore, Madison Ave. & 43rd St.			5.50–12.00	7.50–14.00
Bristol, 129 West 48th St.	1.75–2.00	3.00	2.50– 4.00	3.50– 6.00
Capitol, 8th Ave. & 51st St.	2.50		3.50– 4.00	5.00– 6.00
Carlyle, Madison Ave. & 76th St.			6.00– 7.00	8.00– 9.00
Chesterfield, 130 West 49th St.	1.50–2.00	2.50–3.00	2.50– 3.00	4.00– 6.00
Commodore, Lexington Ave. & 42nd St.			3.50– 5.50	5.50– 8.80
Concourse Plaza, Grand Concourse & 161st St.			3.50– 4.50	5.50– 6.50
Cornish Arms, 311 West 23rd St.			2.25– 3.00	4.00– 4.25
Essex House, 160 Central Park South			6.00– 8.00	8.00–10.00
Fifth Avenue Hotel, 24 Fifth Ave. (9th St.)			5.00– 6.00	7.00– 8.00
Henry Hudson, 353 West 57th St.			2.50– 3.00	3.50– 5.00
Kenmore Hall, 145 East 23rd St.	1.50–2.00	2.50–3.00	2.00– 3.50	3.50– 5.00
Lexington, 48th St. & Lexington Ave.			4.00– 6.00	6.00– 8.00
Luxor Baths Hotel, 121 West 46th St.			2.25– 2.75	4.50– 5.50
Midston House, 22 East 38th St.	2.25–2.50		3.50	4.00– 4.50
New Weston, Madison Avenue & 50th St.			4.00– 6.00	6.00– 9.00
Paramount, 46th St. West of Broadway			3.00– 4.50	4.00– 8.00
Park Central, 7th Ave. & 55th St.			4.00– 5.00	6.00– 8.00
Parkside, 18 Gramercy Park South	2.25		2.75– 3.30	5.00– 6.00
Piccadilly, 227 West 45th St.			3.00– 4.00	4.50– 6.00
Plymouth, 143 West 49th St.			2.50– 3.50	4.00– 5.00
President, 234 West 48th St.			2.50– 4.00	4.00– 5.00
Prince George, 14 East 28th St.			2.50– 4.00	4.00– 7.00
Roosevelt, Madison Ave. & 45th St.			4.50– 8.00	6.50–12.00
Shelton, 49th St. & Lexington Ave.	2.50		3.50– 5.00	5.00– 7.00
Taft, 7th Avenue & 50th St.	2.00–2.50	3.50–4 00	2.50– 5.00	3.50– 8 00
Times Square, 43rd St. & 8th Ave.	2.00–2.50	3.00–3.50	2.25– 3.00	4.00– 5.00
Tudor, 304 East 42nd St.			2.50– 4.00	4.00– 6.00
Victoria, 7th Ave. & 51st St.			3.00– 4.00	4.50– 7.00
Waldorf-Astoria, 50th St. & Park Ave.			7.00–10.00	10.00–12.00
Warwick, 54th St. & 6th Ave.			5.00– 6 00	7.00– 8.00
Wellington, 7th Ave. & 55th St.			3.00– 5.00	4.00– 7.00
Woodstock, 127 West 43rd St.	2.00–2.50	3.50–4.00	3.00– 5.00	4.00– 7.00

NOMINATIONS FOR THE GOVERNING COUNCIL

In accordance with the By-laws of the Association, the Nominating Committee for Governing Council Members consisting of one Fellow from each Section, reports the following nominations for the Governing Council. The By-laws provide that " upon the petition of twenty-five Fellows, the Nominating Committee shall add the name of any Fellow to this list, provided such petition is received fifteen days before the Annual Meeting." The Chairman of the committee is J. J. Bloomfield, Industrial Hygiene Division, U. S. Public Health Service, Bethesda, Md. The other members are: Jessie M. Bierman, M.D., School Health Section; Martha L. Clifford, M.D., Maternal and Child Health Section; Arthur H. Graham, M.D., Epidemiology Section; Leonard Greenburg, M.D., Industrial Hygiene Section; Albert C. Hunter, Ph.D., Food and Nutrition Section; Hugh R. Leavell, M.D., Public Health Education Section; Roy J. Morton, Engineering Section; Hugo Muench, M.D.,* Vital Statistics Section; Sophie C. Nelson, R.N., Public Health Nursing Section; George A. Nevitt, D.D.S., Dental Health Section; William D. Stovall, M.D., Laboratory Section; George M. Uhl, M.D., Health Officers Section.

There are thirty elective councilors on the Governing Council, of whom ten are elected each year. The ten Fellows receiving the highest number of votes on a written ballot cast by the Fellows present and voting at the Annual Meeting in New York City will be elected for the three year term 1944–1947.

* Alfred J. Lotka, D.Sc., acted as alternate for Dr. Muench when the latter became ill.

Gregoire F. Amyot, M.D.
Provincial Board of Health
Victoria, B. C.

George Baehr, M.D.
New York, N. Y.

Leona Baumgartner, M.D.
Department of Health
New York, N. Y.

Harold D. Chope, M.D.
Rockefeller Foundation
Sao Paulo, Brazil

James A. Crabtree, M.D.
U. S. Public Health Service
Washington, D. C.

Laura A. Draper, R.N.
Community Health Service
Minneapolis, Minn.

Halbert L. Dunn, M.D.
Bureau of the Census
Washington, D. C.

Haven Emerson, M.D.
DeLamar Institute of Public Health
New York, N. Y.

Gordon M. Fair
Harvard University
Cambridge, Mass.

Fred T. Foard, M.D.
U. S. Public Health Service
Denver, Colo.

Wilton L. Halverson, M.D.
State Director of Health
San Francisco, Calif.

C. A. Holmquist
State Department of Health
Albany, N. Y.

Benjamin G. Horning, M.D.
W. K. Kellogg Foundation
Battle Creek, Mich.

H. E. Kleinschmidt, M.D.
American Red Cross
New York, N. Y.

A. J. Lanza, M.D. (Lt. Col., M.C.)
Office of the Surgeon General
War Department, Washington, D. C.

Kenneth F. Maxcy, M.D.
Johns Hopkins University
Baltimore, Md.

Karl F. Meyer, M.D.
University of California
San Francisco, Calif.

Friend Lee Mickle, Sc.D.
State Department of Health
Hartford, Conn.

Harry S. Mustard, M.D.
DeLamar Institute of Health
New York, N. Y.

N. P. Neilson, Ph.D.
University of Utah
Salt Lake City, Utah

Paul Parrot, M.D.
Ministry of Health
Quebec, Que.

J. T. Phair, M.B., D.P.H.
Department of Health
Toronto, Ont.

William H. Sebrell, Jr., M.D.
National Institute of Health
Washington, D. C.

Thomas F. Sellers, M.D.
State Board of Health
Atlanta, Ga.

Charles E. Shepard, M.D.
Office of Coordinator of Inter-American Affairs
Washington, D. C.

Brigadier General James S. Simmons (M.C.)
Office of the Surgeon General
U. S. Army, Washington, D. C.

Henry F. Smyth, Jr., Ph.D.
Mellon Institute for Industrial Research
Pittsburgh, Pa.

James G. Townsend, M.D.
National Institute of Health
Bethesda, Md.

H. A. Whittaker
State Board of Health
Minneapolis, Minn.

Estella F. Warner, M.D.
U. S. Public Health Service
Chicago, Ill.

APPLICANTS FOR MEMBERSHIP

The following individuals have applied for membership in the Association. They have requested affiliation with the sections indicated.

Health Officers Section

Addison D. Aldrich, M.D., 402 Vivian St., Houghton, Mich., Director, Houghton-Keweenaw-Baraga. District Health Dept.

Laurence M. Blanke, D.O., 36 Court St.. Dedham, Mass., Member, Board of Health

Philip I. Boyd, M.D., Antigua, British West Indies, Medical Officer, Leeward Islands Government

Benoit Fortin, M.D., D.P.H., 6 Hotel Dieu, Chicoutimi, Que., Medical Officer of Health, Health Unit

James M. Goto, M.D., Topaz Base Hospital, Topaz, Utah, Chief of Surgical Services

Clara R. Johns, M.D., 515 Lincoln St., Topeka, Kans., Acting Director, Division of Maternal and Child Health, State Board of Health

Alfred C. LaBoccetta, M.D., 4000 N. Front St., Philadelphia, Pa., Supt. and Medical Director, Philadelphia Hospital for Contagious Diseases

Rueben Levenson, M.D., 3476 Fulton St., Brooklyn 8, N. Y., Medical Inspector, New York City Health Dept.

Henry B. Makover, M.D., W.F.A., South Agricultural Bldg., Washington, D. C., Surgeon (R), U. S. Public Health Service

Jay C. Miller, M.D., Kootenai County Health Unit, Coeur d'Alene, Ida., Medical Director

Dr. Manuel A. Vinas, Pdte Trujillo 70. S. Fco. Macoris, Dominican Republic, W. I., Medical Officer, Dominican Public Health Dept.

Luther P. Walter, M.D., M.P.H., 2800 Enfield Road, Austin, Tex., Director of Local Health Services, State Board of Health

Jesse J. Weight, M.D., 81 E. Center, Proco, Utah, Utah County Health Officer

Francis D. Wilder, M.D., U. S. Public Health Service, Delta Medical Center, Greenwood, Miss., Medical Officer in Charge

Laboratory Section

William W. Ayres. M.D., 5th Med. Batt., 5th Marine Div., Camp Pendleton, Oceanside, Calif.

Mrs. Howard D. Beckstrom, 250 S. 1st West, Brigham City, Utah, Bacteriologist, Bushnell General Army Hospital

Bernice A. Carter, M.P.H., 912 W. Kalamazoo

St., Lansing, Mich., Bacteriologist, Michigan Dept. of Health Laboratories

Mary C. Cumberland, Sc.D., 1024 N. Broadway, Baltimore 5, Md., Research Asst., Poliomyelitis Laboratory, Johns Hopkins School of Hygiene and Public Health

Miguel Forero-Nougues, c/o Colombian Consulate, New Orleans, La., Trainee, New Orleans Board of Health

Lt. Richard H. Hardenbrook, Laboratory and Sanitation Work, U. S. Army

Stephen H. Hart, East Third and Kilgour, Cincinnati 2, Ohio, Asst. Chemist, U. S. Public Health Service

Loretta H. Kapp, 6502 Salem Pike, Cincinnati 30, Ohio, Physical Therapy Technician, William H. Wolfram, M.D.

Richard H. Keune, PhM3/c., U.S.N., Abatu, NTC, Disp. Laboratory, Lido Beach, L. I., N. Y., Laboratory Technician

C. H. Lakey, 412 East Fifth St., Austin 2, Tex., Chemist, State Health Dept.

Corp. Rudolph LaRocca, 928 21st St., Union City, N. J., Bacteriologist, 2nd Service Command Laboratory

Ens. Don W. Micks, 5th Med. Batt., 5th Marine Div., Camp Pendleton, Oceanside, Calif., Malariologist, Malaria and Epidemic Control Unit 103

Jose Oliver-Gonzalez, Ph.D., School of Tropical Medicine, San Juan, P. R., Asst. Professor of Parasitology

Jean C. Owens, 3630 Marine Ave., c/o Midwestern Medical Center, St. Louis, Mo., Senior Technician in charge of Laboratory, U.S.P.H.S., Venereal Disease Div.

Frank R. Peabody, 439 Park St., Birmingham, Mich., Bacteriologist, Mason General Hospital, U. S. Army

Capt. Jose A. Rivera, Halloran General Hospital, Staten Island, N. Y., Asst. Chief, Laboratory Service

Leo A. Schmid, M.S., 4501 N. Charles St., Baltimore, Md., Student, Johns Hopkins School of Hygiene and Public Health

C. Patton Steele, Public Health Laboratory, Box 1020, Bismarck, N. D., Bacteriologist in charge of Laboratory, State Health Dept.

Max L. Sweat, M.S., 459 Hollywood Ave., Salt Lake City, Utah, Chemist, State Dept. of Health

Reese H. Vaughn, Ph.D., 339 Hilgard Hall, Univ. of Calif., Berkeley, Calif., Div. of Fruit Products, College of Agriculture

Capt. Joseph A. Walkowski, Sn.C., Deshon General Hospital, Butler, Pa., Chief of Laboratory Service

William C. Ware, 225 W. So. Temple, Salt Lake City, Utah, Interested Citizen

William A. Warnick, 71 E. 4th No., Salt Lake City, Utah, Interested Citizen

Sgt. William D. Weinstein, Bacteriologist and Parasitologist in Army Laboratory

Helen Wilson, Box C, University Sta., Grand Forks, N. D., Instructor in Bacteriology, Univ. of North Dakota Medical School

David J. Zimmer, 820 Philadelphia Ave., Silver Spring, Md., Laboratory Asst., National Institute of Health

Vital Statistics Section

Virginia Breaks, 1805 Flower St., Bakersfield, Calif., Public Health Statistician, Kern County Dept. of Public Health

Paul H. Jacobson, A.M., 1601 Metropolitan Ave., New York 62, N. Y., Statistician, Bureau of Records and Statistics, Dept. of Health

J. Wallace Rion, M.A., State Dept. of Public Health, Atlanta, Ga., Assistant Sanitarian (R), U. S. Public Health Service

George V. Truss, 304 City Hall, P. O. Box 2591, Birmingham 2, Ala., Director, Bureau of Records and Vital Statistics, Jefferson County Board of Health

Engineering Section

Capt. Marion E. Boriss, Sn.C., Station Hospital, Camp Claiborne, La., Post Medical Inspector

Olen C. Carter, 818 East Whittier St., Columbus 6, Ohio, Engineer, Environmental Sanitation Div., State Dept. of Health

Robert L. Clayton, 3637 Adams Ave., San Diego, Calif., Food and Market Inspector, City Health Dept.

Major Kern H. Copeland, Sn.C., Camp Lockett, Calif., Medical Inspector, Sanitary and Public Health Engineer

Maurice L. Cotta, W.F.A., Office of Labor, 309 Terminal Sales Bldg., Portland, Ore., P. A. Sanitary Engineer (R)

J. A. DeSerpa, D.V.M., 223 Chrisman Ave., Ventura, Calif., Chief, Division of Sanitation, Ventura County Health Dept.

John B. Drake, M.S., 1402 Smith Tower Bldg., Seattle, Wash., Senior Milk Sanitarian, State Dept. of Health

Hoyt A. Frederick, 813 N. 11th St., P. O. Box 212, Herrin, Ill., Sanitary Engineer, State Health Dept.

Francisco A. Gonzalez-Hernandez, M.S., Box 100, Aguadilla, P. R., Student, School of Tropical Medicine

Lawson Haynes, 2006 Crescent Rd., Charleston, W. Va., Plant Supt., West Virginia Water Service Co.

Mark D. Hollis, 605 Volunteer Bldg., Atlanta, Ga., Senior Sanitary Engineer, U. S. Public Health Service

Jack N. Lewis, City Health Dept., Houston, Tex., Chief, Health Inspection Div.

L. DeWitt McCarter, 921 Bergen Ave., Jersey City, N. J., Supt., Hudson County Mosquito Extermination Commission

Edie M. Rivera, Torres 73, Ponce, P. R., Director, Public Works of Ponce

Arthur C. Robinson, 1405 Smith Tower, Seattle, Wash., Senior Food Sanitarian, State Dept. of Health

Jorge I. Rosso-Castaing, Estrella 60, Ponce, P. R., Student, School of Tropical Medicine

David L. Segal, 4724 Biona Drive, San Diego 4, Calif., Food and Market Inspector, City Health Dept.

Serge V. Spiridonoff, Vallejo City Water Dept., City Hall, Vallejo, Calif., Water Purification Engineer

Karl L. Zander, 126 Ramona Ave., El Cerrito, Calif., Public Health Engineer, U. S. Public Health Service

Industrial Hygiene Section

Lt. Aram Kerkian, U.S.N.R., Medical Field Research Laboratory, Camp LeJeune, N. C., Sanitation Research Officer

Jack Neal, M.S., Room B-10, State Capitol, Salt Lake City, Utah, Engineer, State Dept. of Health

Julian C. Wessel, D.D.S., 4743 Frankford Ave., Philadelphia 24, Pa., Industrial Dental Consultant

Colonel John R. Wood, M.C., Medical Research Laboratory, Edgewood Arsenal, Md., Director

Food and Nutrition Section

Franklin C. Bing, Ph.D., 1135 Fullerton Ave., Chicago 14, Ill., Director, American Institute of Baking

LaVerne E. Clifcorn, Ph.D., 31 LeMoyne Parkway, Oak Park, Ill., Director, Product and Process Research Division, Research Dept., Continental Can Co., Inc.

William F. DeLorenzo, 142 Mt. Prospect Ave., Newark, N. J.

Robert A. Diehm, Ph.D., 10 N. Clark St., Chicago, Ill., Member, Scientific Advisory Committee, Nutrition Foundation, Inc.

Stephen L. Galvin, 7427 Blvd., East, North Bergen, N. J., Member, Scientific Advisory Committee, Nutrition Foundation, Inc.

C. G. Harrel, 208 3rd Ave., S.E., Minneapolis, Minn., Director of Research, Pillsbury Flour Mills Co.

Norman F. Kennedy, 5 E. 45th St., New York, N. Y., Director of Research, Corn Industries Research Foundation

Lloyd K. Riggs, Ph.D., 25 E. Delaware Place, Chicago, Ill., Director of Research, Kraft Cheese Co.

Elda Robb, Ph.D., 31 Bay State Rd., Boston, Mass., Professor of Nutrition and Director, School of Home Economics, Simmons College

Louise Scott, State Dept. of Health, Des Moines, Iowa, Nutritionist, State Dept. of Health

Maternal and Child Health Section

Robert H. Alway, M.D., Dept. of Pediatrics, University of Utah, Salt Lake City, Utah

Ruth E. Brong, M.A., 418 Gallatin St., N.W., Washington, D. C., Consultant, Maternal and Child Welfare, District of Columbia Health Dept.

Kenneth S. Landauer, M.D., State Dept. of Health, Albany, N. Y., Chief, Cardiac Bureau, Div. of Maternity, Infancy and Child Hygiene

Myrtle Letford, 517 South Perry, Montgomery, Ala., Nutrition Consultant, State Health Dept.

Alice Potter, M.D., 3rd and Parnassus Ave., U. C. Hospital, San Francisco, Calif., Pediatrician, San Francisco Board of Health

Dorothy L. Shindel, M.D., 4000 N. Front St., Philadelphia, Pa., Chief Resident Physician and Assistant Supt., Philadelphia Hosp. for Contagious Diseases

Ruth R. Storer, M.D., 430 A, Davis, Calif., Asst. Health Officer, Yolo County Health Dept.

Linda McC. Woods, R.N., 2210 Pennsylvania Ave., N.W., Washington 7, D. C. Director, Columbia Hospital Clinic, Columbia Hospital for Women

Public Health Education Section

Estill Allen, Jr., M.A., Lydia Patterson Institute, Box 11, El Paso, Tex., Teacher of Health

Murcell E. Allen, 311 Denny St., Richmond, Va., Student in Public Health Education, Yale University

William W. Biddle, Ph.D., 17 Brief Ave., Upper Darby, Pa., Senior Health Specialist, Region I, Farm Security Admin.

Julia C. Branca, R.N., 287 East 10th St., New York, N. Y., Health Officer in charge of Medical Dept., Boys' Club of New York

Marjorie B. Estabrooks, M.A., State Dept. of Public Instruction, Olympia, Wash., Health Education Consultant, State Dept. of Health

Ellen C. Feusner, M.P.H., P. O. Box 128, Fontana Dam, N. C., Junior Supervisor of Health Education, Tennessee Valley Authority

Burnice E. Fussell, 6916 Avenue I, Houston 11, Tex., Student, Yale School of Public Health

Luella K. Gunn, R.N., 425 Flynn Bldg., Des

Moines, Iowa, Exec. Sec., Polk County Tuberculosis Assn.

James Jensen, M.S., 17 W. 2nd North, Brigham City, Utah, Teacher, Box Elder High School

Marjorie Josselyn, R.N., M.A., 398 Main St., Hackensack, N. J., Actg. Exec. Director, Bergen County Tb. & Health Assn.

Lt. Myron R. Kirsch, Sn.C., Moore General Hospital, Swannanoa, N. C., Post Medical Inspector and Venereal Disease Control Officer

S. Elizabeth Lovell, M.S.P.H., District Health Dept., Chapel Hill, N. C., Health Educator, Orange-Person-Chatham District Health Dept.

Mary Power, 607 Loew Bldg., Syracuse, N. Y., Community Health Educator, Onondaga Health Assn.

Mrs. Malcolm Smith, 711 Stovall Office Bldg., Tampa, Fla., State Commander, Women's Field Army, American Society for Control of Cancer

Public Health Nursing Section

Edna L. Hedenberg, R.N., 2217 Lemoyne St., Los Angeles 26, Calif., Director of Nurses, City Health Dept.

Louise James, Health Dept., Laurel, Miss., Supervising Nurse, Jones County Health Dept.

Ethel L. Kallins, 725 W. Macon St., Decatur, Ill., Public Health Nurse, U. S. Public Health Service

Mina M. Macknight, R.N., Suisun, R.F.D., Calif., School Nurse, Vallejo Unified School District

Dorothea S. Macon, R.N., Box 791, El Campo, Tex., Supervising Nurse, Gulf Health Dept.

Mary D. Petrella, 629½ 4th St., Santa Rosa, Calif., Public Health Nurse, American Red Cross.

Grace V. Plum, R.N., San Jose State College, San Jose, Calif., Nurse and College Instructor

Hazel A. Robinson, 165 W. Stadium Drive, Stockton, Calif., Nurse in charge, Metropolitan Life Insurance Co.

Florence L. Scott, 1007 6th St., Bismarck, N. D., Orthopedic Nursing Consultant, State Health Dept.

Patricia Walsh, M.A., 1208 East University, Ann Arbor, Mich., Supervising Nurse, Washtenau County Health Dept.

Olive E. Weir, R.N., 1203 Pennsylvania Ave., Boulder, Colo., Student, School of Nursing, Univ. of Colorado

Epidemiology Section

Roy A. Nipko, D.V.M., 1220 South State, Salt Lake City, Utah, Veterinarian

George E. Parkhurst, M.D., 5510 Green Tree Rd., Bethesda, Md., Junior Officer, Venereal Disease Division, U. S. Public Health Service

School Health Section

Elizabeth C. Davis, M.A., 10 Breckenridge Apts., Louisville 3, Ky., Health Counselor, Louisville Board of Education

Jessie R. Garrison, M.A., State Dept. of Education, Montgomery, Ala., Consultant

Christine B. Higgins, R.N., 60 Brownell St., New Bedford, Mass., Public Health Nursing Supervisor, State Dept. of Public Health

Georgia H. Hood, A.M., Michigan Dept. of Public Instruction, Lansing 2, Mich., Health Education Consultant

Harold Jack, Ph.D., 1861 St. Clair, St. Paul 5, Minn., Supervisor, Health, Physical Education and Recreation, State Dept. of Education

Augusta C. Kritz, M.D., 55 W. 95th St., New York, N. Y., Medical Inspector, Dept. of Health

Martha L. Lahey, M.A., 31 Gifford Ave., Jersey City, N. J., Asst. Supervisor of Physical Education, Jersey City Public Schools

Jean I. Lash, R.N., 2561 S. Durfee Ave., El Monte, Calif., School Nurse, El Monte Union High School

Lenore I. Taylor, M.A., 1290 S. Minneapolis, Wichita 9, Kans., School Nurse, Board of Education

Dental Health Section

Francis A. Arnold, Jr., D.D.S., National Institute of Health, Bethesda 14, Md., Dental Surgeon, U. S. Public Health Service

Otto W. Brandhorst, D.D.S., 4952 Maryland Ave., St. Louis, Mo., Dentist

Cloyd C. Buckis, D.D.S., 1010 Carnegie Hall, Cleveland 15, Ohio, Supervisor of Mouth Hygiene, City Div. of Health

William H. Crawford, D.D.S., 1121 W. Michigan, Indianapolis, Ind., Dean, Indiana University School of Dentistry

E. Eldo Ewbank, D.D.S., Kingman, Ind., Secretary-Manager, Indiana State Dental Assn.

Gay S. Hildreth, D.D.S., 363 S. Arlington St., Akron, Ohio, Chairman, Council of Dental Health, Akron Dental Society

Hugo M. Kulstad, D.D.S., 6381 Hollywood Blvd., Hollywood 28, Calif., Dentist

William N. Miller, D.D.S., 207 Dryden Bldg., Flint 3, Mich., Dentist

Wendell D. Postle, D.D.S., College of Dentistry, Ohio State Univ., Columbus, Ohio, Dean

Bernard Z. Rabinowitch, D.D.S., 5371 Wil-

shire Blvd., Los Angeles, Calif., Asst. Professor in Pedodontics, College of Dentistry, Univ. of Southern California

Ernest A. Sahs, D.D.S., Box 147, Earlville, Iowa, Delaware County Chairman, Iowa State Dental Health Committee

Paul R. Shenefield, D.D.S., First National Bank Bldg., Pomona, Calif., General Chairman, Council on Dental Health, Southern California State Dental Assn.

Paul H. Shreves, D.D.S., Ave., G. at 7th St., Fort Madison, Iowa, County Chairman for Iowa State Dept. of Health

C. Herman Stewart, D.D.S., P. O. Box 301, Farragut, Iowa, County Chairman of Dental Health, State Board of Dental Examiners

Lawrence D. Sullivan, D.D.S., First National Bank Bldg., Carson City, Nev., Dentist

Henry M. Swenson, D.D.S., 1121 W. Michigan St., Indianapolis, Ind., Instructor in Oral Diagnosis, Indiana Univ. School of Dentistry

Llewellyn B. Van Cott, D.D.S., 330 Garfield Ave., Pomona, Calif., Public Health Dentist, Los Angeles County Health Dept.

Unaffiliated

Robin C. Buerki, M.D., 274 Linden Lane, Merion Station, Pa., Director of Hospitals, Univ. of Pennsylvania, and Dean, Graduate School of Medicine

Mrs. J. C. Clemmons, 2355 Pecos, Beaumont, Tex., Member, City Council of Beaumont

Melvin H. Goodwin, 605 Volunteer Bldg., Atlanta, Ga., Asst. Sanitarian (R), U. S. Public Health Service

Arnoldine Lindsay, Room 388, 1151 S. Broadway, Los Angeles, Calif., Director, Health Division, Los Angeles Council of Social Agencies

George Loewenstein, M.D., 25 East Washington, Chicago 2, Ill., Physician and Surgeon

Frank J. Morgan, Walton, N. Y., Director of Farm Relations, Middletown Milk and Cream Co.

Ruth N. Nisbet, M.A., 1370 S. Logan, Denver 10, Colo., Technician, O. P. Baur's Confectionery Co.

Arthur M. Stokes, M.D., Murray Hill, Mt. Morris, N. Y., Superintendent, Mt. Morris Tb. Hospital

DECEASED MEMBERS

John E. Curtis, M.D., Lemmon, S. D., Elected Member 1944, Health Officers Section

George E. Johnson, M.D., Philadelphia, Pa., Elected Member 1934, Health Officers Section

Clifford C. Young, D.P.H., Lansing, Mich., Elected Member 1912, Elected Charter Fellow 1922, Laboratory Section

EMPLOYMENT SERVICE

The Association Employment Service seeks to bring to the attention of appointing officers the names of qualified public health personnel and to act as a clearinghouse on employment. This is a service of the Association conducted without expense to the employer or employee.

From the registry of persons available, selected announcements are published from time to time. Appointing officers may obtain lists of all registrants on request.

Address all correspondence to the Employment Service, American Public Health Association, 1790 Broadway, New York 19, N. Y.

POSITIONS AVAILABLE

STATE OF WASHINGTON DEPARTMENT OF HEALTH ANNOUNCES THE FOLLOWING OPENING:

Physician as obstetric consultant in Washington State Department of Health. Preferably with 3 years' special residency in obstetrics and gynecology. Salary $5,280 to $6,000 per annum.

Sanitarian. Preferably with public health training and experience. Salary $2,290 to $2,640.

Bacteriologist to take complete charge of local health laboratory. Requirements include college graduation with major in bacteriology and at least one year of employment in a public health laboratory. Salary $190 to $220 per month.

Physician as health officer in county health department in Northwest. Previous public health experience preferable. Entrance salary $440 per month. Permanent position.

Address Lee Powers, M.D., State Director of Health, 1412 Smith Tower, Seattle, Wash.

Wanted: A physician trained in tuberculosis to assume administrative control of the Bureau of Tuberculosis in an eastern city of 200,000 population. Salary $4,500–$5,031 plus cost of living adjustment. Address **Box B**, Employment Service, A.P.H.A.

Wanted: A physician with venereal disease control experience to assume directorship of the Bureau of Venereal Diseases in a large northeastern city. Salary $4,500–$5,000 per year, plus cost of living adjustment and travel allowance. **Box E**, Employment Service, A.P.H.A.

Physician wanted as Director of Maternal and Child Health in western county health department. Preferably with training in pediatrics and venereology. Some venereal disease control work also. Man preferred but woman considered. Must be in good health. Salary $4,500 per year with car and expenses furnished. Position for duration of war. Address **Box S**, Employment Service, A.P.H.A.

Tuberculosis Association in large western city seeks a director of medical social work. Attractive position now open in agency with a dynamic program closely related to official groups. Address **Box D**, Employment Service, A.P.H.A.

St. Louis, Mo., Health Division, Industrial Hygiene Service, seeks two industrial hygienists, either engineers or chemists. Salaries $225 to $250 per month depending on qualifications and experience, plus travel allowances. Address Robert M. Brown, Public Health Engineer, 64 Municipal Courts Bldg., St. Louis 3, Mo.

Wanted: Medical technologists for 550 bed approved California hospital. Give full particulars and state salary desired. Address W. O. Brown, M.D., Kern General Hospital, Bakersfield, Calif.

Public Health Nurses Wanted: Three staff positions available. Generalized program. Annual salary $2,220 to $2,400 plus travel for use of own car. Address Miss Lorilla Britell, Supervisor, King County Health Dept., County-City Building, Seattle 4, Washington.

Health Department of Southern City and County in a rapidly expanding industrial area, population exceeding 200,000, wishes to employ a Director of Division of Preventable Diseases. Salary commensurate with training and experience, $4,100–$4,700 plus allowance for travel. Write **Box P**, Employment Service, A.P.H.A.

Wanted: Bacteriologist or serologist, junior grade, with public health experience preferred, to work in County Laboratory acting in capacity of a State

Branch Laboratory. Permanent position, salary $168 per month with advancement if satisfactory. Apply to Dr. R. G. Beachley, Director of Health and Welfare, Arlington County Health Department, 1800 N. Edison St., Arlington, Va.

Community Health Educator. Wanted a woman, well trained and experienced in modern methods of organizing and conducting health education among neighborhood groups and other adults. Proper personal qualifications essential and would like person having Master's degree. Office with progressive private agency in city, but work chiefly in adjoining suburban and rural areas. Good salary and allowance for automobile expenses. State age, training, positions held, and give references. Address Arthur W. Towne, Secretary, Onondaga Health Association, Loew Building, Syracuse 2, N. Y.

Bacteriologist Wanted with minimum of master's degree in bacteriology and one year's experience in an approved public health laboratory. Woman or draft exempt man, to take charge of newly established, newly equipped laboratory. Must be able to carry out all the usual procedures of a public health laboratory. Write full details including minimum starting salary requirement. All letters including vitae and photo will be promptly acknowledged. Address E. E. Palmquist, M.D., King County Health Department, 402-L County-City Building, Seattle 4, Wash.

Wanted: A Vital Statistician to assume directorship of the Bureau of Vital Statistics in a large northeastern city. Salary $2,500–$3,100, plus cost of living adjustment. Write **Box G**, Employment Service, A.P.H.A.

Wanted: County Public Health Nurse for midwestern state. Present salary $160 per month and travel allowance. Must have had previous experience in public health. Own and drive car. Address District Health Unit 2, West Branch, Mich.

Physician—public health pediatrics. To assist director of maternal and child health in a large California County Health Department. Major duties, conducting of infant and preschool health conferences and school examinations. Beginning salary $390 a month and travel allowance. California license required. Training and experience in pediatrics or public health or both. Immediately available. Address William C. Buss, M.D., Kern County Health Dept., Bakersfield, Calif.

Wanted: Superintendent and Medical Director for tuberculosis sanatorium having 65 bed capacity and average of 35 patients per day. Salary $4,380 with $300 annual allowance for car. Write M. P. Hunter, City Manager, Roanoke, Va.

Public Health Nurse, supervisory work in orthopedics, must have certificate in public health. Salary $2,050 with maintenance of car, meals and upkeep while in the field. Address Dr. R. G. Beachley, Director of Health & Welfare, Arlington Co. Health Dept., 1800 N. Edison St., Arlington, Va.

Wanted: Staff nurses for 200 bed municipal tuberculosis hospital. Salary $190 per month, $35 per month deduction if maintenance desired. Educational program with opportunity for postgraduate work with University credit planned. For full information write Superintendent of Nurses, Firland Sanatorium, Richmond Highlands, Wash.

Wanted: Health officer for County-City health unit. Good opportunity for right man. Salary to start $4,500 per year and travel expenses. Position permanent. Address G. F. Campana, M.D., Acting State Health Officer, Bismarck, N. D.

Wanted: Bacteriologist to direct and operate a modern public health laboratory in southeastern city of 70,000 population. Examinations 1,500 to 2,000 a month, largely serological and milk tests. Salary available to start $2,400 per annum increasing to $2,700 for satisfactory service. Assistant bacteriologist also needed, with available salary of $1,800 increasing to $2,000 if satisfactory service is shown. Write **Box N**, Employment Service, A.P.H.A.

Wanted: School dentist to direct and operate school dental program in southeastern city of 70,000 population. Salary available starting at $3,600 and increasing to $4,000 for satisfactory service. For further particulars write **Box Y**, Employment Service, A.P.H.A.

Wanted: An assistant in Health Division Council of Social Agencies, interested in community organization and health education. Large city and metropolitan area. State age, training and experience. Write **Box X**, Employment Service, A.P.H.A.

FOR OTHER POSITIONS AVAILABLE WRITE EMPLOYMENT SERVICE, AMERICAN PUBLIC HEALTH ASSOCIATION, 1790 BROADWAY, NEW YORK 19, N. Y.

In view of the current active demand for trained and experienced persons in public health, it is suggested that prospective employers communicate directly with the Employment Service, American Public Health Association, 1790 Broadway, New York 19, N. Y., for up-to-date lists of applicants.

POSITIONS WANTED

ENGINEER

Well qualified public health engineer seeks responsible position in New York metropolitan area. **E-480**

Sanitary Engineer, C.E. 22 years' experience as sanitary engineer, 14 as director in state health department, now employed. Desires change. Location immaterial. **E-481**

LABORATORY

Research bacteriologist - veterinarian, now in civil service, desires change to direct or indirect war work. P-3 classification. Considerable laboratory and field experience. Used to foreign travel; will go anywhere. Steady hard worker. **L-470**

Bacteriologist, 29, draft exempt, 3 years' experience public health laboratory, 2 years' experience industrial organization. Experienced in investigation and control activities on water, sewage, and sanitation as chemist, bacteriologist and serologist in syphilis and enteric diseases. **L-465**

Bacteriologist-Serologist, male, with 20 years' experience in state and municipal public health laboratories, last 10 years in administrative capacity, now in charge of a midwest diagnostic laboratory, wishes to make a permanent change. **L-427**

MISCELLANEOUS

Public Health Nurse. B.S. in nursing, William and Mary College, age 53, seeks position as coördinator of public health nursing, educational director, or director student nurse public health program. Prefers Middle Atlantic States. **M-452**

Sanitarian-Veterinarian, age 23, seeks employment in public health field. Experienced as veterinarian, serologist, sanitary inspection. **M-460**

NEWS FROM THE FIELD

PENICILLIN AND SYPHILIS

According to the *Venereal Disease War Letter* issued by the U. S. Public Health Service, Division of Venereal Diseases, Washington, D. C., in cooperation with state health departments, large-scale use of penicillin in the treatment of syphilis is being undertaken by the U. S. Public Health Service and a number of state health departments. J. R. Heller, Jr., Medical Director and Chief of the Venereal Disease Division of the Service, has indicated that several hundred patients with syphilis will be treated with penicillin at rapid treatment centers within a year under this program.

According to Dr. Heller, in several centers studies of the effectiveness of penicillin in the treatment of syphilis will be conducted in collaboration with the Penicillin Panel, Subcommittee on Venereal Diseases of the National Research Council. The data from selected cases will make possible further evaluation of different time-dosage schedules, the most effective of which have not as yet been fully established. Evidence of the value of penicillin in the treatment of syphilis, on the other hand, is already sufficient to warrant large-scale application of the therapy in the interest of both public health and the prospects for recovery of patients for whom the treatment is appropriate.

Three patients treated for early syphilis by U. S. Public Health Service physicians at the U. S. Marine Hospital, Staten Island, N. Y., in 1943 (*A.J.P.H.*, Dec., 1943) remain free of clinical or serologic evidence of syphilis as the period of post-treatment observation approaches a year.

Since the Staten Island research, additional studies have been conducted by the Army, the Navy, and the U. S. Public Health Service in collaboration with the Penicillin Panel. More than 1,000 patients with syphilis in various stages have been treated with penicillin. Accumulating evidence indicates that penicillin does have value in the treatment of syphilis of all types, although additional time must pass before permanence of results can be judged. In many of the cases treated primary and secondary lesions have healed quite promptly. *Treponema pallidum* as observed by darkfield examinations have disappeared in 12 to 24 hours, and blood serologic tests have reversed from positive to negative.

The use of penicillin in this program will be restricted to patients with untreated, early syphilis, darkfield positive, and patients for whom 6 months' or a year's follow-up seems possible. Two schedules of therapy are being considered in the U. S. Public Health Service program—a 4 day schedule and an 8 day schedule.

The first group of State Rapid Treatment Centers, operating in cooperation with the U. S. Public Health Service physicians assigned to state health departments, which will participate are at San Diego, Calif.; Denver and Pueblo, Colo.; Ocala, Wakulla, and Jacksonville, Fla.; Pineville and New Orleans, La.; Ann Arbor, Mich.; Meridian and McLain, Miss.; Albuquerque, N. M.; Charlotte, N. C.; Rush Springs, Okla.; Columbia, S. C. (3 centers); Nashville, Chattanooga, and Memphis, Tenn.; San Antonio, El Paso, and Waco, Tex.; Richmond, Va.; Seattle and Grand Mound, Wash.; and Washington, D. C. Federal Rapid Treatment Centers participating are at

Birmingham, Ala.; Hot Springs, Ark.; Pensacola, Fla.; Savannah and Augusta, Ga.; Greenwood, Miss.; St. Louis, Mo.; Durham, N. C.; Norfolk, Va.; and Charleston, W. Va.

Clinics and physicians are urged to refer suitable patients to nearby RTC's.

RED CROSS TO SUPPLY MEASLES GLOBULIN

The American Red Cross has announced its expectation that by September 1 measles globulin prepared from blood donated by the American people to the Red Cross for the fighting forces will be available for distribution through health departments. According to the announcement, health departments will apply to the Red Cross in Washington. It will be distributed subject to the condition that the person receiving the globulin may not be charged for it. Manufacturers and those concerned with distribution may not make any profit. The costs of processing and shipping are to be paid by the health department or other agency which is given a permit by the Red Cross. The price for an adult dose is estimated at about $1.10.

The globulin is separated from blood by the Cohn process developed at the Harvard Medical School by Dr. Edwin J. Cohn, and under a coöperative project with the Office of Scientific Research and Development.

U. S. PUBLIC HEALTH SERVICE HEALTH EDUCATION FELLOWSHIPS AVAILABLE FOR MEN

The U. S. Public Health Service announces that, through the coöperation of the National Foundation for Infantile Paralysis and the W. K. Kellogg Foundation, additional fellowships for health education are now available for qualified men of certain Selective Service classifications as well as for women.

Fellowships will lead to a Master of Science degree in Public Health. They will provide for 12 months' training in public health education, 3 months of which will be supervised field experience; $100 a month for 12 months, full tuition and travel. Training will be given either at the University of North Carolina, Yale University, or University of Michigan.

Forms for application for fellowships may be obtained from the Surgeon General, U. S. Public Health Service, Washington 14, D. C. Applications must be accompanied by a transcript of college credits and a small photograph, and must be in the office of the Surgeon General not later than August 15, 1944.

INFANTILE PARALYSIS GRANTS

The National Foundation for Infantile Paralysis announces twenty-seven grants totalling $1,128,770 for the nation-wide fight against infantile paralysis. The grants have been made to leading universities, laboratories, and other organizations throughout the country and will be operating by July 1. Three long-term programs, each covering a 5 year period, are included. Two are for the purpose of improving knowledge in the field of physical medicine made to the Medical School of the University of Minnesota and Northwestern University Medical School, and the third, made to the University of Michigan School of Public Health, will finance and operate an expanded virus study unit.

NORTHERN CALIFORNIA PUBLIC HEALTH ASSOCIATION

The following are the new officers of the Northern California Public Health Association elected at a recent meeting:

President—Dwight M. Bissell, M.D., San Jose
President-elect—Edward Reinke, Berkeley
Vice-President—Ann Wilson Haynes, San Francisco
Secretary—Margaret Beattie, Berkeley
Treasurer—Helen Hartley, Stockton
Representative on Regional Board, Western Branch, A.P.H.A.—Malcolm H. Merrill, M.D.

El Presidente

de la

República de Cuba

En uso de las facultades que le están conferidas por las leyes y a propuesta del Consejo Supremo de la Orden

Confiere:

la Condecoración de la Orden Nacional de Mérito

Carlos J. Finlay

en el grado de

Comendador

a la Sociedad Americana de Salubridad

Dado, firmado y sellado por el Ejecutivo de la República y refrendado por el Ministro de Salubridad y Asistencia Social, Gran Canciller de la Orden, en el Palacio de la Presidencia, en la Habana, a 3 de Diciembre de 1944.

Presidente.

Primer Ministro.

Ministro de Salubridad y Asistencia Social, Gran Canciller de la Orden.

Dr. Alberto Recio, Minister of Public Health of Cuba recently announced the opening of the National Institute of Hygiene in Havana which took place on May 17, 1944. On the occasion President Batista presented decorations of the Order of Carlos J. Finlay to Brigadier General James S. Simmons, Director of Preventive Medicine, Office of the Surgeon General, U. S. Army, Washington, D. C.; Colonel Harry Plotz, Chief of the Division of Virus and Rickettsial Diseases, Army Medical School, Washington, D. C.; Dr. Rolla E. Dyer, Director of the National Institute of Health, Bethesda, Md.; Dr. Reuben Kahn, University of Michigan, Ann Arbor, Mich.; Dr. Henry Hanson, Commissioner of Health of the State of Florida, Jacksonville, Fla.; and Dr. A. A. Moll, Executive Secretary of the Pan American Sanitary Bureau, Washington, D. C.

At the same time the Cuban Government presented decorations to the Rockefeller Foundation, the American Public Health Association (reproduced above), and a posthumous award to the American Yellow Fever Commission in honor of the great services rendered to yellow fever control.

UNIONS APPROVE PREËMPLOYMENT SYPHILIS EXAMINATIONS

Dr. J. C. Geiger, Director of Public Health, San Francisco, Calif., announces a new procedure in the Industrial Venereal Disease Control Program. The Bay Area Metal Trades Council, of the American Federation of Labor, unanimously passed a resolution approving voluntary preëmployment serologic examinations which are conducted by management in coöperation with health departments.

Under the operation of this program voluntary preëmployment serologic specimens will be secured by medical representatives of management. These specimens will be submitted to the laboratory of the City and County of San Francisco Department of Public Health. The results of these laboratory findings are referred to the local Division of Venereal Diseases. Information is kept strictly confidential between the health department and the individual tested. Information pertaining to the results of these examinations is reported neither to labor unions nor to management.

The Division of Venereal Diseases assumes responsibility of advising employees of positive serologic examinations. Industry is advised that it is not justified in considering the presence of syphilis in an employee under treatment or adequately treated as a cause for discharge from employment. Such an attitude is detrimental to the war effort, a hindrance to progressive industrial venereal disease control, and leads to plant management-labor union conflict.

"Latent syphilis is not a danger to industry. It is nerosyphilis and cardiovascular syphilis, the results of latent syphilis, which present the potential industrial hazard. The Health Department and not industry or labor unions must assume the responsibility for requiring adequate treatment of the known, untreated, or inadequately treated syphilitic industrial worker. Only those workers who are not amenable to, or who do not respond satisfactorily to adequate treatment, should be placed in new occupations commensurate with their physical condition. Venereal disease case finding and case holding can be best managed by the Health Department as an unbiased official agency legally responsible for these activities.

"Failure of the employee to submit to voluntary preëmployment blood tests under this industrial venereal disease control program will in no way jeopardize that person's chances of employment. The program, with the assistance of management and labor unions, will be put into practice in some of the large and small industrial plants under the direction of the Division of Venereal Diseases in San Francisco.

"From the start of this program labor has coöperated fully with the local health agency. The establishment of this program was made possible by the assistance of the California Social Hygiene Association, the coöperation of union officials, and the efforts of members of the Division of Venereal Diseases."

SIGNIFICANCE OF THE UNION HEALTH CENTER

Dr. Manfred Bowditch, the Director of the Division of Occupational Hygiene in the Massachusetts Department of Labor and Industries, has called the attention of the Managing Editor to the *Annual Report* for 1943 of the Union Health Center, New York City. This volume carries a foreword by Dr. Haven Emerson in appreciation of Dr. George M. Price, the founder of the Union Health Center, who died in 1942.

As Dr. Leo Price, the present director, says in his introduction, this report for 1943 is supplemented by historical and other data compiled in the course

of 31 years of experience in an uncharted field of medical service.

"The Union Health Center is a unique institution in American industrial medicine. Prior to its establishment there were numerous medical service plans but they were instituted and administered by employers, management and other agencies. They did not represent the effort of workers in an industry to solve their own health problems through their own coöperative effort. The difference between the ladies' garment workers' health program and others lies, therefore, in the fact that it was conceived and operated by a labor union.

"Today the Center is so large, both in physical size and scope of service, that it can no longer be regarded as an experiment. It stands as a proof that medical service for labor, operated under the control of labor, works and has a valuable place in the community."

No one interested in the subject of group medicine or in the provision of medical services to the general community can fail to be interested in this report.

DR. FERRELL TO DIRECT MARKLE FOUNDATION

John A. Ferrell, M.D., Dr.P.H., has been appointed Medical Director of the John and Mary R. Markle Foundation of New York, effective July 1. Since 1910 Dr. Ferrell has been connected with the Rockefeller Sanitary Commission and the International Health Division of the Rockefeller Foundation, most recently as Associate Director for the work of the Foundation's health program in the United States, Canada, and Mexico.

The Markle Foundation was established in 1927 and since 1935 has limited its activities to research in the medical and physical sciences and the area of its operations to the United States and Canada. The scope of the program has recently been broadened during the war to include the virus diseases and tropical diseases. According to the announcement, the directors of the Markle Foundation contemplate the formulation of a long-term program of research in the fields of the medical and the physical sciences when conditions become favorable and anticipate the appointment of a permanent medical director. Toward the attainment of this goal the directors will have the assistance of Dr. Ferrell.

DR. STRODE APPOINTED DIRECTOR OF INTERNATIONAL HEALTH DIVISION

The Rockefeller Foundation has announced the appointment of George K. Strode, M.D., as Director of the International Health Division of the Foundation, succeeding W. A. Sawyer, M.D., who has retired as Director to become Health Director of the United Nations Relief and Rehabilitation Administration, Washington. Dr. Strode's association with the Foundation goes back more than two decades during which he has been assigned to a variety of responsibilities in several sections of the globe. Recently he has been in charge of the European office of the Foundation as Associate Director. He is a graduate in medicine from the University of Pennsylvania and a graduate in public health from Harvard School of Public Health.

KANSAS PUBLIC HEALTH ASSOCIATION

At a meeting held early in June the Kansas Public Health Association elected the following new officers to serve for the forthcoming year:

President—Leon R. Kramer, D.D.S., Topeka
President-Elect—Paul Haney, M.S., Lawrence
Vice-President—J. E. Wolfe, M.D., Wichita
Treasurer—Evelyn Hannon, R.N., Topeka
Secretary—Jane Taylor, R.N., Topeka
Executive Committee—D. D. Carr, M.D., Topeka; L. W. Rowles, D.V.M., Topeka; Jeanette Rosenstock, R.N., Topeka

CHILDREN'S BUREAU STAFF CHANGES

A. L. Van Horn, M.D., has been appointed Director of the Division of Health Services of the Children's Bureau, U. S. Department of Labor, Washington, succeeding Edwin F. Daily, M.D., who is on leave to serve with the U. S. Army as a Major in the Medical Corps. Dr. Daily will serve in reëstablishing medical and hospital services in some of the liberated countries. Betty Huse, M.D., has replaced Dr. Van Horn as Assistant Director for Crippled Children in the Division of Health Services of the Bureau with which she has been associated since 1939.

Dr. Van Horn, who is a native of North Carolina, is a graduate in medicine of the University of Michigan Medical School, and was at one time Chief of the Bureau of Child Hygiene of the Ohio State Department of Health. Since 1936 he has been regional medical consultant for crippled children and for maternal and child health programs with the Children's Bureau, and in 1937 was made Assistant Director of the Crippled Children's Division, becoming Director in 1941.

Dr. Huse, who is a native of Nebraska, is a graduate in medicine from Cornell Medical College and was at one time connected with that institution in the department of pediatrics.

Dr. Daily has been in charge of the emergency maternity and infant care program administered by the Children's Bureau under which nursing and hospital care are given service men's wives and infants. He is a graduate in medicine of the University of Colorado.

MEDALS AWARDED FOR SERVICE ON TYPHUS COMMISSION

It has recently been announced that medals for exceptionally meritorious service have been awarded to Captain Charles S. Stephenson, U. S. Navy; Dr. Rolla E. Dyer, Assistant Surgeon General, U. S. Public Health Service; and Brigadier General James S. Simmons of the U. S. Army; all members of the United States of America Typhus Commission concerned with the control of typhus among United States armed forces overseas and with the prevention of the introduction of typhus fever into the United States.

PERSONALS

Central States

CHARLES F. ATKINSON, M.D.,† Health Officer of Missaukee, Kalhaska, Crawford and Roscommon Counties Health Unit, Traverse City, Mich., has been placed in charge of the Grand - Traverse - Leelanau County Unit, Traverse City, Mich., succeeding BUELL H. VAN LEUVEN, M.D.,† Saulte Sainte Marie, Mich.

LORIN E. KERR, M.D.,* who has been Health Officer of Lorain County, Ohio, has resigned to accept appointment as Surgeon (R), U. S. Public Health Service, and has been assigned as Regional Medical Officer of the War Food Administration with offices in Portland, Ore.

WILLIAM H. RUMBEL, M.D., of Hubbard, Ohio, was appointed Director of the Bureau of Dental Hygiene. Dr. Rumbel, who took over the post June 12, succeeds STEPHEN V. LUDDY, who left the State Health Department to take a position with the City Health Department of Alexandria, Va.

JAMES P. SHARON, M.D.,† Mount Pleasant, Mich., has resigned as Director of the Isabella County Health Unit to accept a position with the Mississippi State Board of Health, Jackson, Miss.

* Fellow A.P.H.A.
† Member A.P.H.A.

FRANK F. TALLMAN, M.D.,† who has been Director of Mental Hygiene in the State of Michigan for the past two and one-half years, is resigning to accept the position of Commissioner of Mental Disorders in the Ohio State Department of Public Welfare, Columbus, Ohio. There are 15 hospitals for the mentally ill, feebleminded, and epileptic in the Division of Mental Diseases which Dr. Tallman will supervise, with a population of about 27,000 patients. In addition to his work with the hospitals, Dr. Tallman will be responsible for a receiving hospital program, and a state-wide program of mental hygiene.

Eastern States

MAJOR MEYER J. PLISHNER,† Sanitary Corps, AUS, of Framingham, Mass., after his recent promotion was assigned to the Medical Intelligence Division of the Surgeon General's office, Washington, D. C., where he is working under Lt. Colonel Gaylord W. Anderson, M.D.*

WILBUR A. SAWYER, M.D.,* formerly Director of the International Health Division, Rockefeller Foundation, New York, and who was recently appointed Director of Health, United Nations Relief and Rehabilitation Administration, Washington, now makes his headquarters with UNRRA at 1344 Connecticut Avenue, N.W., Washington, D. C.

HUGH H. SMITH, M.D.,† of the staff of the International Health Division, Rockefeller Foundation, has been appointed Regional Director of the International Health Division for the United States, Canada, and Mexico to succeed JOHN A. FERRELL, M.D., DR.P.H., who has become Medical Director of the John and Mary R. Markle Foundation, New York, N. Y. Dr. Smith has been a member of the staff of the International Health Division since 1930, serving in the New York Laboratories of the Division, in Jamaica, Brazil, Colombia and Great Britain, where he has been stationed for the last three years.

CLAIRE W. TWINAM, M.D., DR.P.H.,† former Acting Superintendent of Lakeville State Sanatorium, Middleboro, Mass., has been appointed to succeed CARL C. MACCORISON, M.D., as Superintendent of North Reading State Sanatorium, North Wilmington, Mass. In September, 1943, he was appointed Superintendent and Medical Director of the King County Tuberculosis Hospital, Seattle, Wash.

Southern States

ALBERT L. CHAPMAN, M.D., M.P.H.,† P.A. Surgeon, U. S. Public Health Service, has been detailed to Charleston, W. Va., as the Deputy Health Commissioner. Dr. Chapman assumed his duties on June 19. The Deputy Health Commissioner will be under the administrative direction of the State Health Commissioner to act as assistant in administration; to coördinate the activities of all bureaus and divisions of the department; to act for the State Health Commissioner in his absence; and to do related work as required.

ARTHUR P. RICHARDSON, M.D., Head of the Department of Pharmacology of the University of Tennessee, Knoxville, Tenn., has been appointed Head of the Division of Pharmacology of the Squibb Institute for Medical Research, New Brunswick, N. J., to become effective October 1, 1944. Dr. Richardson will replace

* Fellow A.P.H.A.
† Member A.P.H.A.

H. B. VANDYKE, M.D., who has accepted the position as Head of Pharmacology, College of Physicians and Surgeons, Columbia University, New York, N. Y.

WALTER J. RILEY, M.D.,† formerly of Sutton, W. Va., has been named Health Officer of District No. 4 at Weston, W. Va., to succeed CLAUDE A. THOMAS, M.D.

HENRY VAN D. STEWART, M.D.,† formerly of Little Rock, Ark., was recently appointed in charge of the Perry County Department of Health, Hazard, Ky.

DR. HAZEL K. STIEBELING has been appointed Chief of the Bureau of Human Nutrition and Home Economics of the Department of Agriculture, effective June 30, to succeed DR. HENRY C. SHERMAN, who will return to Columbia University. Dr. Stiebeling has for fourteen years been a leading nutrition expert of the Bureau. She was a member of the technical group at the United Nations Conference on Food and Agriculture at Hot Springs, Va. She is now a consultant of the United Nations Relief and Rehabilitation Administration.

JAMES P. WARD, M.D.,* Greenville, Miss., Director of the Washington County Health Department, has resigned to accept a position with the Standard Oil Company as physician on the Island of Aruba.

PAUL A. WRIGHT, M.D.,† Jackson, Ky., has been named Health Officer of Fulton County, Ky., succeeding Jesse M. Dishman, M.D., who was recently transferred to Benton, Ky.

Western States

JACOB C. GEIGER, M.D.,* Director of Public Health of the City and County of San Francisco, Calif., was granted the decoration "Al Merito" by the Ecuadorian Government for "distinguished service, for noteworthy and indomitable leadership in the advancement of public health in the Americas."

* Fellow A.P.H.A.
† Member A.P.H.A.

CONFERENCES AND DATES

American Association for the Advancement of Science—Annual Meeting and Annual Science Exhibition. Cleveland, Ohio. September 11–16.

American Congress of Physical Therapy—23rd Annual Scientific and Clinical Session. Hotel Statler, Cleveland, Ohio. September 6–9.

American Dietetic Association—27th Annual Meeting. Palmer House, Chicago, Ill. October 25–27.

American Public Health Association—Second Wartime Public Health Conference and 73rd Annual Business Meeting. Hotel Pennsylvania, New York, N. Y. October 3–5.

American Public Works Association. St. Paul, Minn. September 24–27.

American Water Works Association—
- North Dakota Water and Sewage Works Conference—Grand Pacific Hotel, Bismarck, N. D. September 12–13.
- Western Pennsylvania Section—Roosevelt Hotel, Pittsburgh, Pa. September 13–14.
- Rocky Mountain Section—Cosmopolitan Hotel, Denver, Colo. September 21–22.
- American Public Works Congress—St. Paul, Minn. September 24–27.
- Southwest Section—Hotels Stephen F. Austin and Driskill, Austin, Tex. October 17–19.
- Missouri Valley Section—President Hotel, Kansas City, Mo. October 23–24.
- California Section—Biltmore Hotel, Los Angeles, Calif. October 24–26.
- West Virginia Section—Chancellor Hotel, Parkersburg. W. Va. October 26–27.
- New Jersey Section—Atlantic City, N. J. November 2–4.
- Four States Section—Benjamin Franklin Hotel, Philadelphia, Pa. November 8–10.
- Florida Section—Suwanee Hotel, St. Petersburg Fla. November 16–18.

Association of Military Surgeons of the United States. Hotel Pennsylvania, New York, N. Y. November 2–4.

Biological Photographic Association—14th

American Journal of Public Health
and THE NATION'S HEALTH

Volume 34 September, 1944 Number 9

The Wartime Health Picture in an English City

ARTHUR MASSEY, C.B.E., M.D.*
Medical Officer of Health, Coventry, England

COVENTRY has been well in the news during the present war, for at the time of the sustained enemy air attacks on Britain in 1940–1941, it was a "front-line" town and was, in fact, the first provincial town to suffer concentrated enemy bombing. It was the heavy attack on the night of November 14–15, 1940, which brought Coventry into the world headlines and added the word "coventrate" to the German vocabulary. Other equally bad raids were suffered in April, 1941, and there have been dozens of smaller attacks at various times.

These events are now past history. They are mentioned here only because of the health and social problems—immediate and remote—to which they gave rise or contributed.

EPIDEMIOLOGY

At the time of the air attacks, damage to drainage communications and water mains was extensive, and the typhoid hazard was real. Preventive measures included (a) intensive local propaganda—by press, posters, and Ministry of Information loudspeaker vans—urging the boiling of drinking water and milk, (b) chlorination of water supplies, (c) facilities for anti-typhoid inoculation, and (d) steps to secure the early restoration of water pipes, sewers, and drains. On each occasion, the position was quickly cleaned up and no typhoid cases attributable to the raid conditions did in fact occur.

Apart from air raid damage, other wartime factors, such as abnormal movements of population, shelter life, overcrowded billets, and the like might well have been expected to bring serious epidemiological consequences. This happily has not been the case so far, as will be seen from Table 1 relating to cases notified locally.

In regard to diphtheria, the immunization campaign has been intensified during the war. At present 81 per cent of the school children and 46 per cent of the preschool children in the city have been immunized. The work is proceeding as fast as parental accept-

* Guest of the American Public Health Association at fourteen state and regional meetings during May and June, 1944.

TABLE 1

Year	Typhoid and Paratyphoid	Diphtheria	Cerebrospinal Fever	Scarlet Fever	Measles	Whooping Cough
1938.....	19	212	36	406		
1939.....	4	277	11	831		
1940.....	23	224	46	408	584	129
1941.....	27	258	53	166	1,414	476
1942.....	5	162	29	415	1,236	194
1943.....	2	103	18	610	2,223	372

ance will permit. We have some way to go in this matter before we can emulate the record of certain of your American cities.

During last winter, the first influenza epidemic of the war occurred. It began in November, 1943, and came to an end in January, 1944. The behavior of influenza during the war has been unexpected in that all misgivings in this connection regarding the "blitz" year (1940–1941) proved to be unwarranted. The 1943–1944 outbreak occurred unusually early in the season, and the anticipated recurrent wave in March did not materialize. The outbreak was not at all comparable with the grave epidemic of 1918. It was rather in the category of a "nuisance raid." The mortality was slight, but the loss of working time was considerable. During the outbreak, some 15 per cent of all employees in local factories, for example, were off work at any given time on account of influenza. The infecting agent was probably the same type of virus—virus A—as that first recovered in Britain in 1933.

A SHADOW ON THE HEALTH PICTURE

The increased incidence of venereal diseases has cast a dark shadow on the health picture. At the venereal diseases treatment center there has been a wartime increase in attendances amounting to about 70 per cent.

The local problems of social hygiene are particularly difficult because of the absence of parental influences or of service discipline in the large numbers of young civilians drafted to the city from various parts of the country, for munitions work.

To aid the combat against venereal diseases in Britain, the Government some two years ago introduced Regulation 33.B. Briefly, this regulation gives powers to medical officers of health to require examination and treatment to completion of any person who has been cited by two venereal disease patients as the source of their infection and who is confirmed upon examination to be infected. Less formally, persons are followed up similarly who have been cited by one patient. The procedure introduced by the new regulation is proving most useful, although it has its limitations.

TUBERCULOSIS

There has been some wartime increase in pulmonary tuberculosis. The tempo and resultant strain of war work and, to a lesser extent, the difficulties of ventilation inseparable from the blackout of factories, offices, and dwellings,

TABLE 2

		Year					
		1938	1939	1940	1941	1942	1943
Pulmonary Tuberculosis	Cases Notified	231	250	278	301	315	351
	Deaths	138	134	174	138	126	
Non-Pulmonary Tuberculosis	Cases Notified	67	58	62	50	61	53
	Deaths	20	25	32	17	32	

are contributory factors. The wartime dietary can be exonerated.

The local increase in the incidence of the pulmonary form will be seen from Table 2, although the mortality curve is now falling.

HOUSING AND ENVIRONMENT

From 1942 onward, the local housing shortage has been marked. This is due to an increasing population, the virtual cessation of house building during the war, and the considerable loss of preëxisting houses through enemy action. Inexorably this has produced a degree of domestic overcrowding which would not be tolerated by peacetime standards.

The adverse repercussions are social rather than epidemiological.

A mitigating feature in regard to housing has been the large-scale public provision of excellent workers' hostels, each a village in itself.

In post-war housing plans, it is likely that prefabricated dwellings will have their place, at any rate for some years. Speed and economy of labor in erection rather than lower cost appear to be the points in favor.

Among the properties destroyed by enemy action were considerable numbers of houses that had been scheduled for slum clearance. The future slum clearance program for the city has thus been greatly simplified.

A sanitary problem of some importance has been occasioned by rat infestation of bombed sites, and energetic measures are in operation against this menace.

WARTIME DAY NURSERIES

Since 1941, there has been a comprehensive chain of day nurseries and nursery classes in the city. Their primary purpose is to care for the young children of married women who are willing to do essential war work and who cannot otherwise do so owing to domestic ties. The nurseries provide a most valuable means of giving systematic medical and educational care to large numbers of children of preschool age. Objections were raised by some against the policy of day nurseries on the ground that they were conducive to the spread of the common fevers. Experience in Coventry does not support this view.

NUTRITION

The available records of the school medical service and of the maternity and child welfare centers indicate a satisfactory state of nutrition among the child population. The figures shown in Table 3 relating to the nutritional state of school children, as ascertained by routine medical inspection, well illustrate this:

TABLE 3

	Percentages			
Year	*Excellent*	*Normal*	*Slightly Subnormal*	*Bad*
1938 (pre-war)	27.62	63.84	8.49	0.05
1943	33.62	64.56	1.81	0.01

The meals and milk in schools scheme, and the Ministry of Food policy of supplying free to young children cod liver oil and fruit extracts are making a valuable contribution in the matter of wartime child health. The British Restaurants Movement, too, is helping in the maintenance of a satisfactory nutritional level in the adult population.

MENTAL HEALTH

The people of Coventry (as those of other "blitzed" towns) stood up well to the experiences of heavy bombing, and cases of neurosis resulting from the raids were few. Cases of true shell-shock were negligible.

It is evident that the average mind can withstand the occasional heavy stress better than continued smaller stresses. Thus in the prevention of

neurosis, depressing psychological influences must be removed. Locally the clearing up of bombed sites is one of the measures that have contributed usefully in this matter.

VITAL STATISTICS

The figures in Table 4 represent the vital statistics of Coventry in wartime and in the year immediately prior to the war, viz.:

TABLE 4

Year	*Death Rate*	*Marriage Rate*	*Birth Rate*	*Infant Mortality Rate*
1938	9.5	20.6	16.5	56.0
1939	9.4	24.3	17.7	54.6
1940	13.3*	25.7	16.4	63.0
1941	12.8*	24.5	17.1	54.8
1942	10.2	20.2	19.3	62.3
1943				

* Including air-raid fatalities.

The local death rate is low if air raid deaths are excluded. The increasing birth rate is related *inter alia* to good economic conditions. The infant mortality rate is at present withstanding the impact of difficult social conditions of which an increase in illegitimacy is not the least important.

HOSPITAL POLICY

In Coventry the two large general hospitals—one voluntary and one municipal—sustained severe damage in the November, 1940, raid. Later, one was largely destroyed in the April, 1941, attack.

Certain temporary reconstruction works have been completed, and the situation has also been assisted greatly by the Ministry of Health group scheme under which routine evacuation of patients to outside group hospitals takes place. These emergency arrangements are meeting the wartime position.

After the war, both the Voluntary and the Public Hospital Authorities are faced with the task of completely reconstructing their general hospital services. It is a unique opportunity for securing an integrated hospital service and plans to that end are under discussion.

CONCLUSION

In the foregoing are set out briefly a few of the main public health topics of Coventry in wartime. The health picture shows both bright and dark features. The bright side is represented by a freedom from epidemics, a good state of nutrition, satisfactory vital statistics, and an excellent morale. On the black side are the increased incidence of venereal diseases and phthisis, housing shortage, and domestic overcrowding. On the whole, the health account is in credit. In regard to the city's vicissitudes through enemy bombing, some compensation is to be found in the enormous opportunity now afforded for bold and healthy town planning. The City Council is not likely to lose this chance of a future Coventry on model lines.

Slum Clearance

The Newark Plan

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SLUMS must go! These areas of depressed living conditions exist and have existed for centuries in every city of the world. It is here that poverty, crime, and disease go hand in hand to establish a reign of antisocial living which is a blot upon our present civilization.

A foreign writer who travelled in America recently, said of one of our large cities, "The wide boulevards, the green belt and lofty blocks of offices along the lake, extend for only a short distance inland. Then come square miles of slums as bad as anything to be seen in the East End of London, the Villette quarter of Paris or the Moabit district of Berlin. Small wonder that these suburbs have bred so many gangsters. I would willingly commit a great crime to get away from such an environment." (*Pioneers! O Pioneers!* by Saunders).

THE CAUSE OF SLUMS

A slum is defined as "a low filthy quarter of a city or town, a street or place where debauched and criminal persons live or resort." Such a description neglects, however, to mention that slums are directly associated with substandard housing conditions and, indeed, these are the direct causes of slum development. The definition goes further and indicates buildings in the last stages of dilapidation and structural disrepair. It usually indicates buildings so far gone in disrepair, as to be unfit for habitation according to our modern standards of living.

The slum is not so much a menace to humanity by itself, as by the persons who are forced by economic necessity to live there. These dwellings naturally attract the poor, the ignorant, careless, and criminal part of the community, where generally a total disregard of accepted methods of decent living are tolerated and sometimes preferred.

The congested slum sections of cities have developed as a result of the great immigration of workers from country districts attracted by the higher wages to be earned in our factories and industries. This influx of population found our cities totally unprepared to cope with the demands for adequate housing. These new workers were compelled, therefore, to seek accommodation in old dilapidated buildings, the relics of a former generation now dead and gone, or removed to other more desirable parts of the city. As city population increased, more and more of these old buildings were used up.

The majority of these old buildings were long past any usefulness as decent houses and were without any of the essential requirements of modern living. Thousands of our population are therefore, forced by economic conditions to live in premises without adequate lighting or ventilation, without sanitary plumbing, and without baths or other means for maintaining a good standard of personal hygiene.

The fire hazards are also high in these tinder boxes and at times the overcrowding causes the loss of life to be high when fires occur.

NEWARK'S SLUMS

Newark, like other large cities, has its full share of the slum problem. In this city, housing has been for many years an acute problem.

There are certain wards, particularly the third ward of this city, where the rate of house deterioration has been such, that many of the buildings used for occupancy of thousands of individuals are at present unfit for human habitation.

The onset of World War II with the consequent increase in the number of war workers has brought about undesirable and dangerous overcrowding. We are therefore faced with a steadily decreasing number of suitable homes and an increasing demand for them among our working groups.

In the survey conducted by the State Housing Authority (1934–1938) of a total of 44,451 dwellings located in Newark, 4,718 were declared unfit for use as dwellings, and 16,926 were found to need major repairs. In other words, approximately 50 per cent of the dwellings in the city had already deteriorated or were in a state of deterioration to such a degree as to make them unfit for habitation.

In the year 1934 a survey of the city housing situation was made by the local Health Department, under the Civil Works Administration program. The results obtained showed 8,558 families consisting of 57,636 persons living in overcrowded conditions, the majority of whom lived in the so-called slum areas.

Similarly in 1937, a survey by the City Health Department was conducted in the third ward. In this ward, all previous surveys had shown that slum conditions, overcrowding, bad housing, etc., were more generally present than in other parts of the city. The results of this survey were enlightening and revealed the following facts among 2,010 dwellings surveyed:

	Per cent
Dwellings in good condition.....	7
Major repairs were needed.....	54.2
Dwellings unfit for habitation....	14.8
Infestation with rats, mice and vermin	80
Sanitary violations existed.....	94
Dwellings built prior to 1902....	70

The greater majority of these substandard dwellings were without baths, private indoor water closets, or central heat.

SLUMS AFFECT HEALTH

Apart from the questions of crime and juvenile delinquency which are naturally more prevalent in slum areas, the effects of the depressed housing upon health is well indicated in the Third Ward Survey.

Tuberculosis morbidity rate in this ward was four times as great as for the rest of the city. The venereal disease prevalence rate was six times as great as for the city as a whole. The same holds true for all the other major epidemic diseases, the third ward showing an undue prevalence of all of them.

A famous Admiral once said "the speed of a convoy is the speed of its slowest ship." Thus the health of a city is in the main, the health of its slums as well as its sunbathed residential districts. The high disease and death rates in congested districts is counterbalanced by the low prevalence of disease in its better residential districts, thus establishing a mean or average rate which is not truly representative of the health of a population in every part of the city.

A comparison of the general death rates of the city with that of the industrial section known as the Ironbound District, showed that the latter had a death rate of 9.1 as compared with 12.6 for the rest of the city. In this section, although entirely low income, there was not the same congestion of the population and property dilapidation as existed in the third ward.

SHALL NEWARK BECOME A SLUM CITY?

The question which had to be considered was, " Shall Newark be allowed to sink into a morass of slum buildings and become a slum city, because of a lack of a program to bring about decent housing conditions? " The problem appeared to be a stupendous one, totally beyond our capacity as a city to solve without the spending of millions of dollars far beyond our ability to underwrite.

A limited step in this direction was made by the adoption of the Federal Housing projects which were initiated under the Wagner-Stegall Act, and subsequently the U. S. Housing Authority. Under this authority a $14,000,000 program was adopted to provide homes for 2,469 Newark familiies in six separate projects. These projects were located in the areas of worst congestion and bad housing, and brought about the demolition of a considerable number of substandard dwellings. These housing projects were, however, only a drop in the bucket of our need for slum clearance, and up-to-date dwellings for our working population.

The results of the various housing surveys showed that there was a crying need for some long-range plan of concerted action by those whose responsibility it was to safeguard the health morals, safety, comfort, and general welfare of our Newark citizens. If this were done there could be no grounds for civil or criminal negligence charges, should a great fire or an epidemic of disease sweep through these city plague spots.

A city-wide demolition of all our substandard areas was out of the question, unless such buildings could be immediately replaced by suitable dwelling units. This was beyond our vision at this time, so we have preferred to wait for a federal or state plan as a post-war project. Such a project would call for the demolition of all slum property and the reconstruction of dwellings in conformance with modern sanitation, fire and building regulation.

Faced with the situation of large areas of the city being in the slum class, with a steady deterioration of all dwellings more than fifty years of age, and a steady, increasing demand for more homes for war workers, it was very urgent that some plan be devised to salvage the slum property if it was possible to do so. Such a plan had to be along the following lines:

1. A city ordinance adopted making it mandatory for owners to remodel buildings in accordance with modern standards of living.

2. The rehabilitation of all substandard dwellings, bringing them up to modern sanitary, fire and building standards, in conformance with new housing regulations.

3. The demolition of those dwellings and structures beyond rehabilitation and declared to be unfit for use by the Building, Fire, and Health Departments.

Following these recommendations, the Newark City Commission, at the request of Director John A. Brady, Director of Public Affairs, had an ordinance passed July 14, 1943.

This ordinance entitled, " An ordinance to repair, close or demolish dwellings which are unfit for human habitation," had the following requirements:

1. The office of Supervisor of Rehabilitation of Dwellings, was created, the Health Officer of the city being designated to fill this office.

2. Upon the filing of a petition by a public authority, or by five residents of the city, or upon the Supervisor's own motion that there exists a substandard building which, due to dilapidation, disrepair, or structural defects, increases the hazards of fire, accident, or other calamities rendering the property detrimental to the health and safety of the residents, the Supervisor

is required to make a preliminary investigation.

3. If the Supervisor finds the condition to be as stated, he is required to serve notice upon the owner for a hearing upon the case.

4. The owners or parties interested have the right to file an answer at the time and place fixed in the complaint.

If the Supervisor, after the hearing, determines that the building is unfit for human habitation, he is required to serve notice on the owners and parties interested, as follows:

1. If the repairs, alterations or improvements of the building can be made at a cost not exceeding 50 per cent of the value of the dwelling, the owner is directed to carry out such repairs within a period of ninety days. The owner is given the option of vacating or closing the building within this period.

2. If the repairs or alterations cannot be made at a cost of less than 50 per cent of the value of the building, the Supervisor is required to make an order requiring the owner to remove or demolish the building within a period of 90 days.

If the owner fails to alter, improve or demolish the building within the period set, the Supervisor is required to put a notice on the premises saying, "This building is unfit for human habitation."

The Supervisor is authorized to rehabilitate or demolish any building in case of non-compliance.

The amount of the cost of any repair or removal or demolition of any building, remains as a municipal lien against the property upon which said cost is incurred.

Where there is money obtained by the sale of any material after demolition, the Supervisor is directed to deposit the same in the Court of Chancery, to be disbursed in such manner as the Court directs, to the owners or parties in interest. Any person affected by an order of the Supervisor, may petition the Court of Chancery for relief, in accordance with Chapter 112 p.c. 1943. R.S. Cum. Supp. 40–48–2–3, *et seq.*

1. The Supervisor is authorized to investigate the dwelling condition in the city of Newark, in order to determine which dwellings are unfit for human habitation.

2. To administer oaths, affirmatives, examine witnesses, and receive evidence.

3. To enter upon premises for the purpose of making examination, provided that such entry shall be made in such manner as to cause the least possible inconvenience to the persons in possession.

To carry out the requirements of the ordinance a beginning was made with those properties known to be in the worst structural condition, irrespective of the location in the city. Inasmuch as the Building Department of the city had a list of many hundreds of buildings slated for demolition by reason of structural defects, it was considered advisable for the Supervisor to begin with the list to determine how far any of them could be salvaged for habitable purposes.

For the purpose of obtaining a coördinated report upon each property to determine the extent of sanitary, building, and fire prevention defects, a score card was drawn up to be filled in for each dwelling.

This report known as the Unfit Dwelling Record, has a full description of the building with a photograph of the structure at the time of investigation. The various defects are scored by giving a maximum score of 100. The conditions recorded in the score are:

Type of house
Age
Rental
Heat
Condition
Toilets

Baths
Water supply (hot or cold)
Light rooms (natural or artificial)
Ventilation (front, rear, or cross)
Dark or windowless rooms
Interior painting
Plumbing (modern or old)
Toilets (inside building or porch)
Floors
Accident hazards
Vermin infestation
Roof gutters and leaders
Exterior repairs
Cellars dry with cement floor
Foundations

Any dwelling failing to attain a minimum score is declared unfit for human habitation.

HEARINGS

Hearings before the Supervisor take place every 2 weeks, at which time representatives of the Building Department, the Fire Prevention Bureau, and the Health Department are present to give evidence upon their reports submitted.

The difficulties so far encountered are, the need for searches for titles where the owners are unknown, or where a number of owners of an estate have to be contacted, frequently living in distant parts of the country and abroad. The Supervisor is unable to take action for rehabilitation or demolition, until all the owners or parties at interest are located and permission is obtained. These searches constitute quite a large part of the work of the Supervisor. No demolition can be ordered by the Supervisor until the proper owners can be established. The same holds true for the rehabilitation of slum property, until sufficient funds shall have been appropriated by the City Commission to make property available for habitation, where the owner refuses to carry out necessary repairs.

Of the 25 cases so far coming before the Supervisor, 6 buildings were either rehabilitated or demolished; 3 were removed from the custody of the Supervisor because of the nature of the tenancy, 9 are pending action within the 90 day period allocated for demolition or rehabilitation, 7 are awaiting action by the Supervisor, the owners having failed to respond to the hearing notices issued by the Supervisor.

The clearance of slums made possible by this ordinance, will depend upon the amount of money appropriated for demolition and repair of slum dwellings. The most practical method would be for a city to establish a revolving fund to be used for demolition and rehabilitation when the owner cannot or will not do the work. The 50 per cent value clause would make the eventual return to the fund a certainty. Provision could be made for such advances to be on a loan basis and an annual return with interest added to current taxes for a reasonable period of years.

The action by the city along these lines has, however, had the effect of making the owners of slum property consider the carrying out of repair and reconstruction where this is possible. Inevitably, the dwellings so far gone as to be impossible of reconstruction within the city will come before the Supervisor for immediate demolition orders.

SUMMARY

Slum clearance is a public health problem of major importance in all large cities in the United States.

The structural disrepair of dwellings has an important bearing on the health of the inmates.

Thousands of people are compelled to live in slums where lighting, ventilation, sanitary needs such as baths and toilets are much below modern standards of living. There is dangerous and unhealthy overcrowding in these areas.

In a State housing survey of the City

of Newark, N. J., in 1934–1938 in a population of 400,000, there were 4,718 houses declared unfit for habitation. Of the 44,451 surveys of dwellings, 16,926 were in need of major structural repairs. Of the dwellings of the city, 50 per cent had already deteriorated to such a degree as to make them unfit for habitation.

In a survey of one of the worst wards of the city, among 2,010 dwellings surveyed only 7 per cent were found in good structural condition. In that ward, the tuberculosis morbidity rate was four times as great as for the rest of the city and the venereal disease prevalence rate was six times as great.

Under the Wagner-Stegall Act, the federal authorities built six projects to provide housing for 2,469 families. This is a drop in the bucket of our real need for housing. Inasmuch as the complete removal of slums must await adequate federal or state funds it was considered advisable to institute a program of salvage for the city with compulsory demolition or rehabilitation of all dwelings declared to be unfit for living purposes. A city ordinance was adopted, creating the position of Supervisor of Rehabilitation of dwellings. Under this ordinance, any slum building which could not be rehabilitated for a sum not exceeding 50 per cent of the assessed valuation was required to be demolished. The cost of demolition remained as a lien upon the property.

Under this ordinance, the Supervisor could order the rehabilitation of any slum building should the owner refuse to do so. The owner of any slum building could be ordered to appear before the Supervisor and present his case for consideration. A score was adopted that covered all the sanitary defects of the building, all its structural and fire hazards. The difficulties so far encountered were the searches for titles to determine correct ownership, as many of the owners are out of the city or abroad.

Sufficient funds must be appropriated by the city government to cover the cost of demolition of outworn property. The creation of the office of Supervisor has started machinery in motion that will encourage the owner of slum property to consider rehabilitation rather than to allow such dwellings to become useless for living purposes.

CONCLUSIONS

The subject of slums in our large cities cannot be ignored by public health authorities. The slum must go! It is a blot upon our modern ideas of fair living conditions for our workers and should not be tolerated. If funds for complete demolition of slum property are not available, then salvage of many dwellings is within the bounds of possibility. At least, dwellings utterly unable to be renovated should be removed.

In all plans for remodelling of slum property, a decent standard of repair should be insisted upon, with the idea of making all changes meet modern standards of house construction.

An Epidemic of Acute Anterior Poliomyelitis in El Salvador, C. A.

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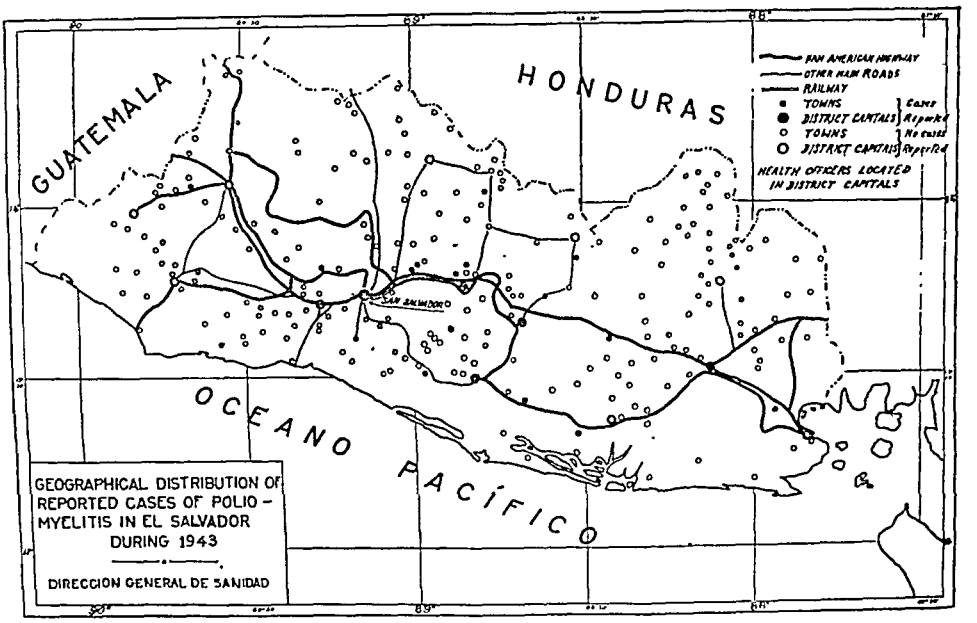
DURING the past year, 1943, a definite outbreak of poliomyelitis occurred in this country, El Salvador, a total of 64 paralytic cases being reported. Diagnostic spinal fluid examinations were done on only 6 cases but the clinical symptoms and signs were checked in all cases except 10 by two or more physicians, and often by four or five. In addition, 17 cases were seen by a consultant in orthopedics. The number of cases given is undoubtedly not absolutely complete because most of the physicians of this country are located in the larger cities; however, it is our belief that practically all paralytic cases were known because the small total area of the country, the density of population (232.5 sq. mile) and the distribution of the health officers, made it possible for the latter to visit or see all the paralytic cases and also visit all suspicious cases which came to their knowledge either through physicians' reports or through indirect channels or even hearsay (see Map. No. 1).

It might be noted that the physicians of this country have considered poliomyelitis a rare disease and the great majority of them acknowledge that they have never seen a case, but there is no doubt that the disease has occurred here because occasional individuals of various ages are seen at times who exhibit the typical sequelae of infection with the virus of poliomyelitis.

In considering the reported cases, only 61 have been used, as there is a little doubt about the other 3. There is no question that the incidence of this disease was well above the usual average, although it is true that this year added impetus to interest in the disease was given by the fact that a child in a rather influential family was among the first ones to become ill and had some residual paralysis. The figures for case incidence during the previous 5 years are not dependable because of the obvious low numbers, and were secured from local hospital records. They follow: 1938—1 case (Hóspital Bloom); 1939—0 cases; 1940—7 cases (2 Hospital Bloom, 5 Hospital Rosales); 1941—1 case (Hospital Rosales); and 1942—1 case (Hospital Bloom). It is possible that a small epidemic may have occurred in 1940 when 7 cases were seen in the local hospitals, but we can only surmise that other cases may have occurred and been unattended.

In 1943, 3 cases were seen before the month of May, namely, 1 in January in San Salvador, 1 in February in Quezaltepeque, and 1 in April in Mejicanos, a small village in San Salvador. In this same village a case was reported on May 29, in a house on the 8a. Calle Oriente. This was a child of 5 who died in 4 days with pharyngeal paralysis. Eight days later a second case appeared in the same neighborhood in a girl of 2 years. This was the

MAP 1



daughter of a man who had returned from California 13 days before. Seven days later a 3 year old sister of the 5 year old child was reported to have the disease. This case and one observed in July were the only ones reported in which more than one case occurred in any one family. The fourth case occurred in a child of 4 months, being at N. 24th Ave. at a considerable distance from the other cases. From this time on no apparent continuity of spread of cases could be determined.

During the first week of July when there had already been 5 cases in San Salvador, the first of 2 cases was seen in the village of Mejicanos, and a week later the first of 4 cases in Villa Delgado. The proximity of these towns to San Salvador might suggest some relationship.

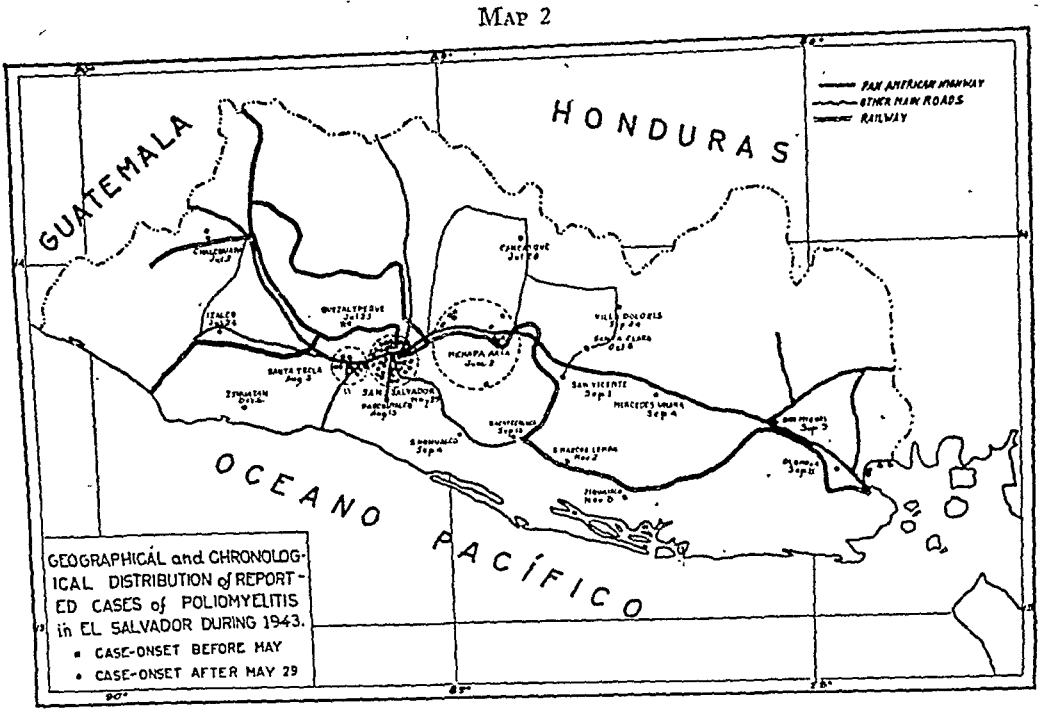
The time sequence and distribution of paralytic cases (see Map No. 2) might suggest that the epidemic showed a radiation from San Salvador (the capital city) as a center, and followed some of the principal routes of communication, viz., the Pan-American Highway, the Highway to Zacatecoluca, the railway to the East. Of course, the number of cases is not sufficient to draw definite conclusions in regard to this supposition.

The following chart shows how the cases seemed to radiate from San Salvador as a center.

Date	*Locality*	*Cases*
Toward the East:		
July 2	Santa Cruz Michapa,	1
July 8	Cojutepeque,	3
Sept. 1	San Vicente,	1
Sept. 4	Mercedes Umaña,	1
Sept. 9	San Miguel,	1
Sept. 11	Olomega,	1
Toward the South:		
Aug. 15	Panchimalco	1
Toward the Southeast:		
Sept. 4	Santiago Nonualco,	1
Sept. 15	Zacatecoluca,	1
Toward the West:		
Aug. 3	Santa Tecla,	8
Toward the Northwest:		
July 23	Quezaltepeque,	1

Five more cases: 1 in Chalchuapa July 10, 1 in Izalco July 24, 1 in Cancasque July 28, 1 in Ishuatán October 6, and 1 in Villa Dolores September 4,

MAP 2



show a more sporadic distribution and are probably related to the normal endemic crop.

In observing the distribution of cases it may be noted that 2 minor outbreaks occurred in 2 separate distinct areas (see Map No. 2). One of them we shall refer to as the outbreak in the Michapa Area and the other as the outbreak in the Santa Tecla Area. The Michapa Area includes the towns of Santa Cruz Michapa, Cojutepeque, San Martin, Perulapán, El Rosario, and Paraíso de Osorio and covers an area within a radius of 18 kilometers of Michapa. There were 10 cases in this area, 9 of which were visited, examined, and confirmed by the local health officer for that district.

The first case in this area was noted in Michapa on July 2, following 3 more in Cojutepeque (July 8, August 20 and 27), 3 in Perulapán (July 25, August 6 and 14), 1 in San Martin, and another in Paraíso de Osorio, August 21, and the 10th case in El Rosario, September 4. It has been suggested that these might be an aftermath of a fair held at Perulapán from June 25–29.

The outbreak in the Santa Tecla Area occurred in a locale about 2 km. wide and 6 km. long on the Pan-American Highway, between kilometer 8 and kilometer 14 to the west of San Salvador. Eight cases were observed and reported here. The first case appeared in the city of Santa Tecla, August 3, the 2nd on a coffee finca in the suburbs, to the west of the city on the Pan-American Highway, August 8, the 3rd and 4th in Santa Tecla on August 12 and 14. The 5th and 6th on a coffee finca 4 km. to the east of the city on the Pan-American Highway, September 3 and 4, the 7th in the city of Santa Tecla on September 9; and the 8th on the coffee finca "Santa Elena" 2 km. to the east and also on the Pan-American Highway. Because of the efficient coöperation between the local health officer and the physicians in this area it is believed that probably all cases here were reported.

As one may see in Table 1, the peak of the epidemic was reached in the San Salvador Area in the week ending July 24; in the Michapa Area, the week ending on August 14, and in the Santa

TABLE 1

Distribution of Cases, by Location and Date of Onset

Week Ending	*S. Salvador Area*	*Michapa Area*	*Sta. Tecla Area*	*Rest of Country*	*Total*
Jan. 2	..	..	..	..	..
9	1	..	..	..	1
16	..	..	..	..	..
23	..	..	..	..	..
30	..	..	..	..	..
Feb. 6	..	..	..	..	..
13	..	..	..	..	..
20	..	..	..	1	1
27	..	..	..	..	..
Mar. 6	..	..	..	..	..
13	..	..	..	..	..
20	..	..	..	..	..
27	..	..	..	..	..
Apr. 3	..	..	..	..	..
10	..	..	..	..	..
17	..	..	..	..	..
24	..	..	..	..	..
May 1	1	..	..	..	1
8	..	..	..	..	..
15	..	..	..	..	..
22	..	..	..	..	..
29	..	..	..	..	..
June 5	1	..	..	..	1
12	1	..	..	..	1
18	2	..	..	..	2
26	..	..	..	..	..
July 3	1	1	..	..	2
10	3	1	..	1	5
17	4	..	..	..	4
24	6	..	..	2	8
31	2	1	..	1	4
Aug. 7	3	1	1	..	5
14	3	1	3	..	7
21	..	3	..	1	4
28	..	1	..	..	1
Sept. 4	..	1	2	3	6
11	..	..	2	3	5
18	..	..	..	1	1
25	..	..	..	..	..
Oct. 2	..	..	..	..	..
9	..	..	..	2	2
16	..	..	..	..	..
23	..	..	..	..	..
30	..	..	..	..	..
Nov. 6	..	..	..	..	..
Totals	28	10	8	15	61

Tecla Area, on August 25. The epidemic reached its apex for the whole country in the week ending August 7.

The localities of the first group are of a purely rural character, and therefore may be taken as an index of the rural incidence of poliomyelitis in El Salvador.

Table 3 indicates a high incidence in the localities of rural character, and also, in the City of San Salvador.

Distribution by Sex

56 per cent males
44 per cent females

Distribution by Age

Per cent	*Age*
6.5	Under 6 months
28.0	" 1 year
49.0	" 2 years
70.5	" 3 years
90.0	" 5 years

TABLE 2

Distribution of Poliomyelitis Cases by Age, Sex and Locality

Age Groups	Males					Females					Grand Total
	I	II	III	IV	Total	I	II	III	IV	Total	
6 months	..	1	2	..	3	..	..	..	1	1	4
6 mo. to 1 year	..	1	5	2	8	2	1	..	..	3	13
1 to 2 yrs.	..	2	3	3	8	1	1	1	4	7	13
2 to 3 yrs.	..	4	..	2	6	1	2	2	2	7	13
3 to 4 yrs.	..	1	1	..	2	1	..	1	2	4	6
4 to 5 yrs.	1	1	..	2	4	..	..	1	1	2	6
5 and over	..	1	1	1	3	..	2	..	1	3	6
Totals	1	11	12	10	34	5	6	5	11	27	61

Distribution of cases and incidence by localities: The localities where these cases have been observed have been divided into 4 groups:

Group I	*Group II*	*Group III*	*Group IV*
Santa Clara	Mejicanos	Santa Tecla	San Salvador
Olomega	Villa Delgado	Cojutepeque	
Cancasque	Quezaltepeque	Izalco	
Ishuatan	Panchimalco	Chalchuapa	
Paraiso de Osorio	Mercedes Umaña	Zacatecoluca	
Michapa	San Martin	San Miguel	
El Rosario	Stgo. Nonualco	San Vicente	
Cuscatlan	San Pedro Perulapán		
	Villa Dolores		

TABLE 3

Distribution of Cases by Class of the Localities Where the Cases Occurred

Localities by Class	Aggregate Pop. as of July 1, 1943	Number of Cases	Rate per 100,000
Group I—500 to 5,000	18,873	7	37.1
" II—5,000 to 20,000	92,599	16	17.3
" III—20,000 to 50,000	223,949	16	7.1
" IV—More than 100,000	106,926	22	20.6
Total	442,347	61	13.7

In this respect the same proportion has been maintained, as has been reported in other epidemics of poliomyelitis.

The marked incidence in younger age groups is rather typical, apparently, of the age distribution of this disease in warm climates.[1] Attention might also be drawn to the fact that in New York City in 1916 70 per cent of the cases occurred in children under 5 years, and in 1915 only 34 per cent of the cases reported were in this age group: likewise the figures given for an epidemic in Cuyahoga County, Ohio, vary from 51.2 per cent in children under 5 years in 1930 to only 19 per cent in this age group in 1941.[2] These figures are typical of an apparent trend toward a higher median age in localities or countries where the disease has been reported for several decades. No definite explanation is given for this change.[3]

It is believed that the reporting of cases in El Salvador this year was sufficiently complete so that the age distribution given is a true one. (A similar high figure for this age group was reported by Dr. German Castillo of Nicaragua at the Fifth Congreso Medico Centroamericano held at San Salvador, El Salvador, in 1938. At this time he read a paper on the outbreak in Managua in the same year, 1938, in which epidemic 42 cases were reported to and seen by him in his capacity as special investigator for the Health Department. Of these 42 reported cases, 97 per cent were children under 5 years of age.)

Four deaths were reported as due

directly to the disease in children between 2½ and 5 years of age. This represents 6.5 per cent mortality of the entire series and 18 per cent in this particular age group. One case of unique interest occurred in a child only 23 days of age, reported by Dr. Miguel A. Luna of Santa Tecla, in which the diagnosis was later confirmed in consultation by five other physicians.

With the exception of the 4 cases which died and showed a bulbo-spinal type of involvement, the rest showed only spinal localization. Fever was the most constant symptom, accompanied in 47 per cent of the cases by coryza and/or pharyngitis. There was nausea and vomiting in 20 per cent of the cases, and diarrhea in 27 per cent. Some showed meningismus, and a few had brief periods of convulsions. Fifty per cent complained of muscular pain.

The interval between the onset of the disease and the development of paralysis varied within rather wide limits. As a rule it was observed between the 3rd and 8th days. In 3 cases it was not noticed by the original attending physicians. In 1 case paralysis was not discovered until the 20th day.

In the primary examination given to 17 patients (this was given anywhere from 16 to 30 days after the onset of the disease, depending on when the consultant was called) by Dr. León Avila Jr.,* orthopedic consultant, the following localizations were found:

Location	*No.*
Left lower limb	5
4 limbs and trunk	2
4 limbs	2
2 inferior limbs	2
Lower right limb	2
Lower left limb and trunk	1
Upper and lower right limbs	1
Upper right limb	1
Upper right limb and lower left limb	1

Of the 45 muscles, or muscular groups affected, those that were most frequently affected are as follows:

Group I
(70% of the cases)
External flexors of the left leg

Group II
(64% of the cases)
Medius and minor left glutei muscles

Group III
(59% of the cases)
Left major gluteus muscles
Internal flexors of the left leg

Group IV
(53% of the cases)
Left quadriceps
External rotators of the left thigh

Group V
(47% of the cases)
Right major gluteus
Major and minor right glutei
Left posterior tibial

Group VI
(41.1% of the cases)
Internal rotators of the left thigh
Left tensor fascia lata
External flexors of the right leg
Adductors of the left thigh
Left anterior tibial
Left peroneus longus
Left peroneus brevis
Left flexor digitorum longus

The first case that was known to the Direccion General de Sanidad was one that occurred during the 2nd week of July. It might be noted that 10 cases had occurred prior to this but had not been reported at that time. However, the Sanidad promptly made contact with the Chief of the Consultorio Infantil of the Hospital Rosales where there is a satisfactory register of morbidity, and it was discovered that there was an obvious rise in the number of cases that had been observed during that same week. Consequently, the physicians of the country were notified to be conscious of the possibility of the presence of an epidemic, the authorities of public education and sports were also

* The aid of Dr. León Avila, Jr., as orthopedic consultant was made possible by the financial assistance of the Servicio Cooperativo Inter-Americano de Salud Pública, an agency of the Dirección General de Sanidad and the Institute of Inter-American Affairs, Division of Health and Sanitation, El Salvador.

notified and the schools and swimming pools were closed. As soon as possible a small pamphlet giving the essential known data and urging medical attention in all suspected cases was prepared and distributed through various channels to the general public.

An interesting sidelight on the promptness with which a physician was called to see such cases before and after this program of education was begun is given in Table 4.

TABLE 4

Number and Percentage of Cases Seen by the Physician in the Indicated Number of Days After the Onset of the Disease, in the Cities of San Salvador, Santa Tecla, Cojutepeque, San Vicente and San Miguel, Before and After Warning the Public

Lapse Between the Onset and the Doctor's Visit	*Before July 21*		*After July 21*	
	No.	*Per cent*	*No.*	*Per cent*
0– 2 days	2	11.1	1	4.8
3– 6 "	5	27.8	11	52.4
7– 9 "	2	11.1	4	19.0
10–12 "	4	22.2	3	14.3
13–15 "	0		0	
16 and more days	5	27.8	2	9.5
Total	18	100	21	100
Visit before the 10th day	9	50	16	76.1
Visit after 15th day	5	27.3	2	9.5

CONCLUSIONS

1. The 1943 poliomyelitis epidemic occurring in El Salvador involved 61 known patients.

2. Analyses are given showing geographical distribution, seasonal occurrence, age distribution, and known main symptoms.

3. The age incidence of reported cases, 90 per cent occurring in children under 5 years of age, is unusual; but no definite explanation for this can be given, although the observation has been made several times that with this infection the median age is often very low when cases first begin to be reported from a given locality.

4. Public warning of the presence of this epidemic was followed by definite shortening of the time lapse between onset of the disease and first medical attention.

ACKNOWLEDGMENT: The author wishes to acknowledge the kindly advice and criticism of Major J. R. Hobbs, M.C., A.U.S., Medical Officer of the Field Party of the Institute of Inter-American Affairs in El Salvador, and also, of Dr. Howard A. Howe and Dr. Kenneth F. Maxcy of the Johns Hopkins School of Hygiene and Public Health.

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An Epidemic of 3,000 Cases of Bacillary Dysentery Involving a War Industry and Members of the Armed Forces*

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ON Saturday, September 12, 1942, a telephone message was received from a practising physician of Newton, Kans., that a severe outbreak of intestinal disorder was occurring in that city. Arrangements were immediately made to send Board of Health personnel to that city and they arrived Sunday morning, September 13.

Newton is the county seat of Harvey County, located in the southeastern section of Kansas, approximately 26 miles north of the City of Wichita. The population was 11,048 in 1940, and apparently there has been little change in the last two years. The population is predominately white, with approximately 1,200 Mexicans and 1,400 Negroes. The topography is gently rolling, sandy loam draining to Sand Creek, a tributary of the Arkansas River, which flows in a southerly direction through the western section of the town.

The main war industries in Newton are the railroad shops, yards, and division offices of the Atchison, Topeka and Santa Fe Railroad, the Ponca Tent Company, and flour mills. Approximately 700 persons living in Newton at the time of the epidemic were employed by airplane factories in Wichita. The local public health personnel included a part-time county health officer and a full-time veterinarian milk inspector.

The source of the public water supply is derived from eight drilled wells having an average depth of 125 feet, located 8½ miles southwest of the city, and is used by more than 95 per cent of the population. The wells are pumped to a surface reservoir and the water is re-pumped from this reservoir into two high service mains. These mains are 12″ and 14″ in size and approximately 8 miles in length before they connect to the distribution system of the city.

The milk shed includes 24 dairies, 4 delivery companies, 2 local pasteurization plants, 1 pasteurizing plant operated by the Santa Fe, and numerous smaller dealers. The known daily milk consumption is 1,300 gal., of which 900 gal. are raw milk and 400 gal. pasteurized. The city operates under the Standard Milk Ordinance, which requires the services of a milk inspector and laboratory for supervision and enforcement of the ordinance.

* Presented at a Joint Session of the Epidemiology, Health Officers, Maternal and Child Health, and Laboratory Sections of the American Public Health Association, at the Seventy-second Annual Meeting in New York, N. Y., October 14, 1943.

There are approximately 30 public eating establishments served by 200 food handlers. The city maintains no supervision or control over these establishments or employees.

The city sewage system is modern in every respect and more than 80 per cent of the houses in Newton are connected to the system.

Upon arrival in Newton, immediate contact was made with physicians of the city and information received indicated that the outbreak was explosive in nature and the geographical distribution was uniform over the entire city.

Samples of water from the city wells and distribution system were taken at once. On Monday, September 14, samples taken from the deep wells showed no contamination; however, those from various points on the distribution system were heavily contaminated. City officials were notified and chlorination of the city water supply by means of an emergency chlorinator at the pumping station, installed by State Board of Health engineers, was started.

Hand-bills were printed, advising citizens to boil all water used for drinking purposes, and prohibiting the sale of milk that had not been pasteurized. Air raid wardens distributed these hand-bills to every home in the city.

As the water department of the Santa Fe Railroad has orders to empty the water tanks on all passenger coaches and fill with the "99.9 per cent pure" Newton water, as advertised by city officials, the division superintendent of the A. T. & S. F. Railroad, was immediately ordered to discontinue the use of Newton city water on passenger trains until such time as it was proved safe for drinking purposes. The City Water Superintendent was given instructions to shut off all public drinking fountains and immediately open fire-hydrants and flush out the water mains.

On Tuesday, September 15, additional personnel of the State Board of Health arrived with laboratory equipment. Headquarters were established and an epidemiological case study of the city was started by health workers. Fifteen nurses, registered with the Civilian Defense organization, volunteered, and were used to block canvass the city to obtain case histories of sick persons.

Laboratory workers obtained stool specimens from hospital cases and a general sample at large.

Early studies of the case reports revealed a massive, generalized, sudden and severe epidemic of dysentery. The average case persisted for approximately 3 to 6 days, and listed as symptoms were weakness, nausea, vomiting, cramps in stomach, persistent diarrhea, and occasional bloody diarrhea. The only possible vehicle was the water supply.

Sanitary engineers checking systematically the distribution system discovered the following defects:

1. Seven cross-connections between the public water supply and private sources of water
2. Seven cross-connections between the public water supply and sewerage system, plus 13 flush tanks in the sewerage system in which the water inlet was below the discharge level of the tank, and a large number of basement ejector pumps located in private residences

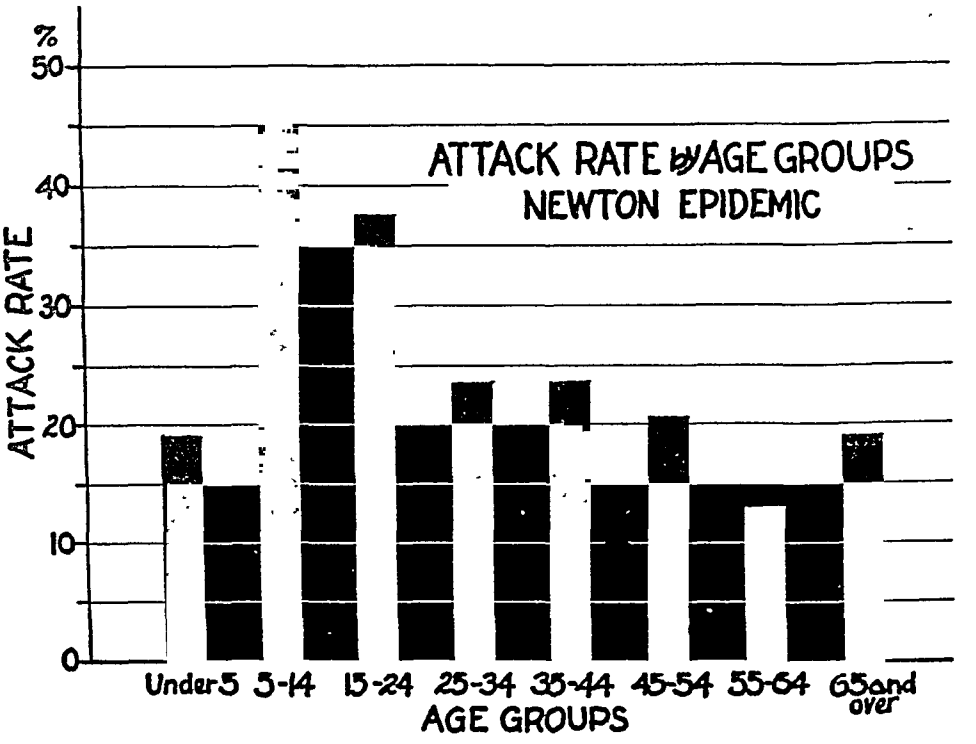
After carefully checking all of the above cross-connections, it was apparent that the source of the contamination had not been discovered.

Epidemiological factors indicated that a large amount of contamination was introduced into the water system at a point from which it could be rapidly circulated through the entire distribution system.

This conclusion was based upon the following factors uncovered in the epidemiological and laboratory studies:

1. Generalized distribution of cases
2. Massive infection of the population

CHART 1—Showing attack rate by age groups



3. Explosive nature of the epidemic
4. Bacteriological analysis of water samples obtained over the distribution system

Upon receiving additional engineering assistance from the District Office of the U. S. Public Health Service, there was a review and discussion of the survey on the distribution system, and efforts to locate the source of contamination were intensified.

On September 18, 4 days after emergency chlorination had been started, the tests showed that a satisfactory chlorine residual was being maintained in all parts of the city. Repeated satisfactory bacteriological analyses having been obtained, the water was released as safe, Saturday, September 19.

A bit of information, which proved of extreme importance, was received from a Santa Fe Railway water department employee who said that a sewer block had occurred at a Mexican village on the southwest outskirts of the city about the time that dysentery cases developed in the city. On Sunday, September 20, an inspection of the water supply, plumbing and sewage disposal of the Mexican village was made by our sanitary engineers.

Contrary to previous statements by city officials, that no change had been made to the distribution system, further information uncovered the fact that changes had been made on the two main supply lines entering the city at a point close to this Mexican village. It developed that on September 7, an 8″ stub and valve were removed and replaced with a 20″ stub and valve. The water pressure was off 9 hours while these changes were made. The next morning, September 8, it was found that the 20″ gate valve had slipped and the section of the 14″ supply line was again taken out of service for more than 3 hours, during

which time the 20″ gate valve was straightened and permanently anchored.

This work was performed by a private contractor, under the supervision of the City Water Superintendent. Our investigation showed that a service connection came from this 14″ main to the Mexican village and supplied three frost-proof hydrants and two water closets equipped with twelve frost-proof toilets. The frost-proof hydrant pits and each of the pits under the water-closets had a drain connection to the sanitary sewer, which had previously been blocked.

Evidence that these pits had been filled with sewage so that it had covered the drain openings in the valves of the frost-proof hydrants, and also the drain connection in the frost-proof toilets, still remained at the time of our inspection.

The hydrants were the only source of water for the Mexican families and the water-closets were used by approximately 112 persons living in the village.

In reconstruction of the situation, when the water pressure was off on September 7 and 8, persons in the village, attempting to get water, apparently opened the valves and, not obtaining water, left them open; this, in turn allowed the sewage backed up in the box to flow through the drain opening into the water main. It is not unreasonable to assume that a person attempting to get water and finding it shut off, would leave the valve open, allowing a continuous flow of sewage through the drain opening. That these valves were open was brought out in later testimony by one of the workers on the mains, who turned them off when the main was put into service. Persons using the water-closets would automatically operate the valves controlled by the seat and thus allow sewage to flow into the water main.

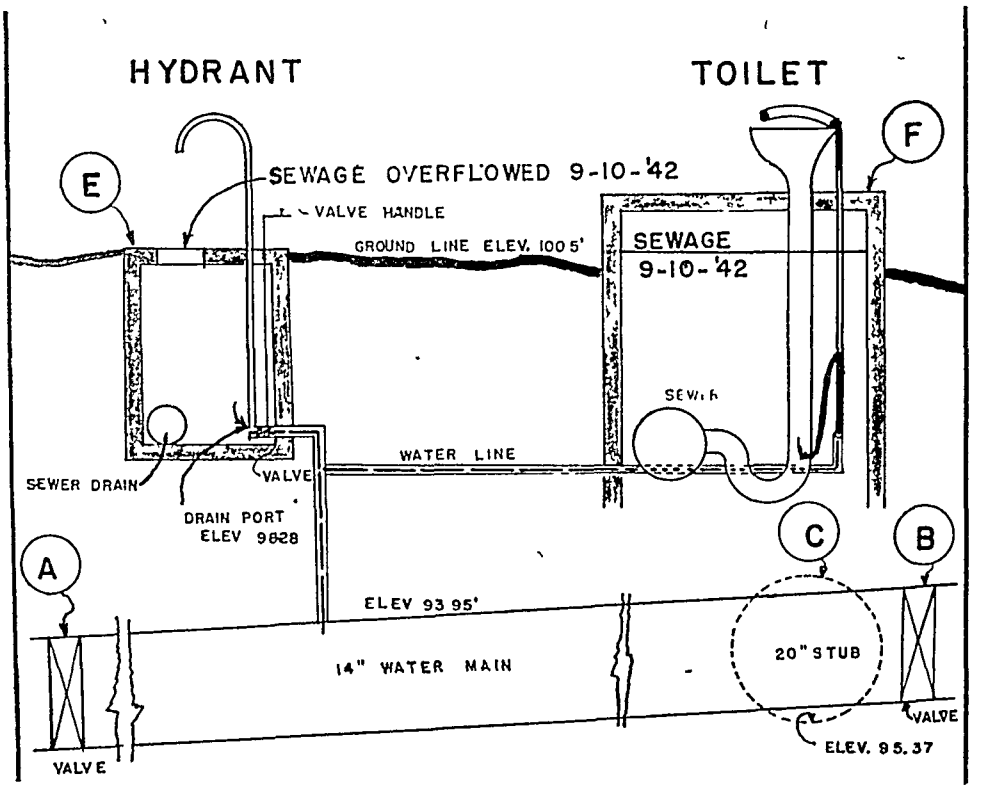
Each time the water main was out of service, only a small amount of water was flushed out of the line before it was placed back in service, and no attempt was made to sterilize it.

Levels were run on the mains and the water take-off to the Mexican village. Since the elevation of the water main was lower at the point of this connection than where the stub was changed, a considerable amount of sewage would remain in the water main after the line was again in service.

In order to prove to city officials that this was possible, conditions equivalent to those at the time the mains were being worked on were reconstructed. Drainage to a hydrant pit was blocked and water placed in the pit, covering the drain port of the frost-proof valve. The hydrant was left partially open, the water line was disconnected at the main and, within a few minutes, dye placed in the hydrant pit was flowing from the disconnected line at the main. Certainly sewage covering those same ports, under similar conditions, would flow into the water main supplying the distribution system of the city. Additional evidence showed that the first 7 cases reported occurred among the Mexican families living in the bunk-houses, and that persons who did not drink water in the city, but did drink from taps on the two supply mains taken off before the water reached the Mexican village, were not infected.

A study of the case histories indicates that slight contamination of the city water supply evidently began about August 1. One hydrant valve in the Mexican village was in bad condition and would not close. Inhabitants of the village were in the habit of emptying sewage through the screen trap in the floor covering the hydrant pit. There were 82 persons who reported they became ill during the month of August, and 124 persons reported the

CHART 2—Schematic charts showing evident flow of sewage entering main



date of onset of their illness to be during the first 6 days of September.

We do know, from a study of the recording manometer on the distribution system, that uniform water pressure was being maintained under great difficulties. In fact, this led to the changes which were made in the distribution lines to include an additional storage tank near the Mexican village. Other cross-connections previously listed may also have been responsible as sources of contamination of the city water supply at times of low pressure.

The epidemiological investigation revealed that the peak onset occurred on September 10, with 743 persons giving this date as the beginning of their sickness. As a result of the epidemic, business in the city was practically at a standstill on Thursday, September 10, when it is estimated about 2,000 persons were ill.

TABLE 1

Onset of Cases by Days

August

Date	Cases	Date	Cases
Aug 1	7	Aug 21	2
3	1	23	2
6	1	24	4
10	2	25	7
12	1	26	4
13	1	27	1
14	3	28	4
15	10	29	8
16	1	30	9
19	1	31	4
20	9		
		Total	82

September

Sept 1	19	Sept 13	115
2	21	14	109
3	14	15	75
4	17	16	38
5	24	17	16
6	29	18	15
7	60	19	5
8	128	20	7
9	410	21	7
10	743	22	0
11	494	23	1
12	256		
		Total	2,603

In the face of such massive infection of the population, local newspapers carried stories on September 11, quoting city water officials regarding the city water, as saying, "a constant check-up by analysis is made, and reports this week are, that the water is absolutely pure and healthful; there are no open mains, no seepage into the distribution system and no chances of contamination." On September 12, the papers carried a story, stating that the part-time county health officer, residing at a small rural village, was in the city and had made all possible investigations into the numerous cases of illness, which, for want of a better diagnosis, were referred to as "intestinal influenza." The newspaper quoted him further as saying that he was unable to find any evidence whatever that the prevalence of the illness was in any way due to trouble with the city water supply or the supply of milk and other dairy products from the regularly inspected dairies; that the same illness had been prevalent in the country, all neighboring towns, and, in fact, all over the Middle West. He also stated that "during damp season, when excessive rains have continued for extended periods, there is much illness of this nature affecting the stomach and bowels." It was his expressed opinion that "a period of a week or so of sunshine would practicaly clear up the illness."

Because of these stories in the daily newspaper and statements made by various local authorities, our investigation was seriously handicapped for several days before satisfactory cooperation was established with city water officials. Because of inadequate health service and lack of supervision by city officials of the municipal water system, the citizens of Newton were misinformed regarding the cause of the epidemic. If adequate investigations had been made as soon as cases first began to occur in August, it is possible that this epidemic might have been prevented.

Laboratory examination showed the predominating organism recovered from the stools of sick persons and from the intestinal mucosa in fatal cases, to have been *Shigella paradysenteriae,* Flexner group (Hiss.).

From scattered cases traceable to Newton, it is assumed there were many cases other than those occurring in the city, since a large number of trains were supplied with water at this station.

There were 2,871 regular passenger cars (Pullman and coaches) supplied with water between the dates of September 3 and the afternoon of September 14, at which time the water was prohibited for use by interstate carriers; also, a large number of troop trains were serviced during this same period.

Histories were obtained from 150 trainmen, who were off duty on account of illness and undoubtedly there were many other railroad employees, who could not be interviewed because of their absence from the city.

Eighty-one employees of the Ponca Tent Company, working on war materials, were also off duty because of illness caused by drinking city water. Two hundred and fifty employees of airplane factories working in Wichita, who lived in Newton, were off duty because of dysentery during the epidemic.

As a result of the Newton epidemic:

1. The State Legislature passed new laws giving additional authority to the State Board of Health to supervise public water distribution systems.
2. Local funds were made available for a health unit.
3. The city plumbing code was revised and put in force, eliminating all cross-connections.
4. Water specimens are being taken at weekly intervals at designated places in the distribution system.
5. Emergency chlorination of the city water supply became a permanent procedure.

SUMMARY

1. An outbreak of more than 3,000 cases of dysentery, with several deaths at Newton, Kans., was evidently caused by sewage entering the water distribution system of the city through frost-proof hydrants and water-closet valves.

2. Failure of the Water Department to sterilize or flush that portion of the distribution system where changes had been made, led directly to heavy infection of the public.

3. Hazardous cross connections, found in the distribution system at times of low pressure, without chlorination, may have been responsible for previous sporadic cases of intestinal disturbance.

4. A great number of war workers were absent from their jobs for several days; an unknown number of soldiers and civilians were infected; the ordinary business of the city was disrupted for a period of 3 days; and important transcontinental trains, many of them troop trains, were delayed an average of 1 hour while taking water at a nearby safe supply.

5. With institution of proper public health protection measures, the epidemic quickly subsided with no further outbreak of cases reported from the city.

Dye Concentration in Resazurin Tablets*

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ONE drawback to the widespread use of the resazurin test has been the necessity for weighing out accurately small quantities of the dye powder in the preparation of a solution of the desired strength. When it was learned in 1941 that standardized tablets were being made available in Britain, steps were taken to interest American dye houses in the preparation of similar tablets, since it was intimated that permits for the export of British tablets were unlikely to be granted during the war. In consequence, a batch of tablets was prepared by the National Aniline Division of the Allied Chemical and Dye Corporation, and samples were submitted for testing. When solutions prepared from these tablets were compared with those prepared from the powder (Eastman) in use in this laboratory, the former were obviously much weaker. It was therefore suggested to the manufacturer that the strength of the tablets be increased. This was done, and solutions prepared from the second batch (No. 10550) were found to agree very closely with those made up from Eastman powder.

When similar tests were run on tablets from two English manufacturers it was discovered that they also were much weaker. Since the English tablets were first made up from Eastman resazurin powder,[5] it was suspected that there were marked variations in the dye content of different batches of their powder. With this in mind, a portion of the batch of dye used by Ramsdell, *et al.*[4] was obtained and tested out against several batches of Eastman resazurin. It was found that the batch used in Britain to standardize both their tablets and their resazurin comparator discs[2] was approximately 22 per cent weaker than that used by Ramsdell, while the batch we had been using, and against which the National Aniline tablets had been standardized, was approximately 25 per cent stronger.

In view of the fact that in England both tablets and comparator discs[2] had been standardized against the weaker batch of dye, the writer was reluctant to recommend a stronger concentration for American tablets. However, after extensive tests with both British and National Aniline tablets had been made, it was the unanimous opinion of the collaborators* that the stronger concentration was preferable. Although it showed slightly more bacteriostatic effect, requiring about 30 minutes longer to reach the pink or white stages with the better grades of milk, it did not appreciably affect the time required to reach the P 7/4 Munsell color standard used in the

* Contribution No. 187 (Journal Series) from the Division of Bacteriology and Dairy Research, Science Service, Dominion Department of Agriculture, Ottawa, Canada.

* Thanks are due to A. Moldavan, Guaranteed Pure Milk Co., Montreal, and to J. Vanderleck, Clark Dairy Ltd., Ottawa, for making extensive comparative tests with the several batches of tablets and powder.

triple reading test.[3] On the other hand, the stronger solution had an advantage in the greater ease of color differentiation, particularly with those milks which give a greyish tinge to the dye-milk mixture. Again, where the resazurin test is being applied to cream, or to abnormal milks such as colostrum, there is a decided advantage in the use of a stronger solution.

Through the courtesy of Robert S. Breed, a Lovibond comparator of the type used in Britain for determining the degree of reduction of resazurin in milk[2] was made available for study. A number of workers in this laboratory have compared this method with the one ordinarily used here (Munsell color standard papers in test tubes), and all agree that the latter is much more convenient and enables closer estimation of color than does the comparator method. It seems unlikely that the comparator method, involving as it does the removal of each tube in turn from the rack, placing in the comparator, finding the matching disc, and returning the tube to the rack, will ever be popular with users of the test in America. Consequently the adoption in North America of a dye strength greater than that used in the standardization of the British comparator discs is unlikely to cause any serious inconvenience.

It is most unfortunate that the various batches of Eastman resazurin should have differed so greatly in strength. It is even more unfortunate that the batch used in England for the standardization of the test should have been weaker than that used by Ramsdell, *et al.*, while the batch used by us was stronger. However, for the reasons indicated, it has been considered desirable to standardize on a stronger dye concentration on this continent. A batch of tablets of the approved strength has recently been approved by the Biological Stain Commission[1] and is now on the market. With these on the market one of the biggest objections to the use of the resazurin test will have disappeared.

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Tomorrow's Opportunities in Tuberculosis Nursing

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PREDICTIONS that we would have a rise in the tuberculosis death rate as a result of war conditions in this country have thus far been happily unfilled.[1] While more previously existing unknown cases have been discovered as a result of mass examinations and x-ray routines among the military forces and industrial workers,[2] even that total has not been staggering. It has, however, served to remind us that in 1942 only 7 states met the recommended standard of one hospital bed for every three annual deaths from tuberculosis.[3] We urgently need more hospital beds and personnel to serve them. Nor do we know what the prolonged strain of war may do to our national resistance. Already tuberculosis, which Sir Arthur MacNulty so aptly calls the " camp follower of war," has taken heavy toll in Europe, reaching almost epidemic proportions in some countries, notably Poland.[4]

As this article is being written, premature and over-optimistic reports have appeared in the popular magazines[5] of cures produced by a new drug, Diasone, a member of the sulfa drug family.[5a] It is to be hoped that Diasone may be a forerunner of other sulfa derivatives giving more certain promise of aid to tuberculosis patients, so that our post-war efforts may be solely directed toward the prevention of new cases and the slogan, " Wipe Out Tuberculosis by 1965 " will be realized, thanks to chemotherapy, but in the meantime, the American Trudeau Society points out[6] that clinical and roentgenological data are inadequate to support a positive evaluation of the curative effects of Diasone and its use is not without hazard to patients. For the moment, we must pursue the course of proved efficacy: an early diagnosis, rest, nourishing food, nursing care under medical supervision, and return to an activity suited to the individual's strength. In this curative program, the public health nurse has a strategic rôle as nurse and teacher.

In 1943, reports showed that 80 per cent of the available hospital beds for tuberculosis (79,860) were occupied, the daily census showing an average of some 65,000 patients,[7] while medical and nursing staffs in tuberculosis hospitals had been just about cut in half by the demands of military service. A survey made by the American Trudeau Society in 1942 indicated that out of 247 sanatoria, 85 per cent filled, 25 had 40 or more patients per graduate nurse.[8] Actual visits to eleven typical sanatoria in October, 1943, revealed a 52 per cent curtailment of graduate nursing staffs employed in normal times.[9]

In the world of tomorrow authorities have already foreseen the need for an additional 44,000 beds for tuberculosis patients,[10] making a total of 123,860. Can we count on adequate graduate

nursing staffs for these patients? In all probability we can, for we will have by 1946 the largest supply of employable graduate nurses in history—some 350,000 if the hoped for rate of production (65,000 students a year) is attained. This is about 1 nurse to every 361 persons in the population. It provides 4 nurses to every physician. Inasmuch as we were keeping only 225,000 nurses busy in 1935, it appears safe to plan now not only to restore normal service which has suffered so considerably from war shortages, but also to take advantage of this unprecedented surplus of nurses to improve the general care of tuberculosis patients. Here, for example, are tuberculosis clinics which at present report their service "shot to pieces" or actually discontinued by war shortages of nurses,[11] others in which teaching programs have been steadily reduced so that they consist in handing the patient a booklet and hoping he can read it. All sorts of nursing short cuts, some of them potentially dangerous to patients and others, have been necessitated in our hospitals.[12] If in three years we are going to have more nurses than we ever had before, if we are to have federal funds for advanced preparation in the clinical fields, then it is not too early to start building a foundation for more and better nursing care of the tuberculous. We must be ready for smooth and rapid expansion after the war. Preparation in this specialty becomes even more pressing in view of the federal appropriations made by Congress in June of this year to the U. S. Public Health Service for the control of tuberculosis.

EDUCATIONAL PREPARATION IN THE SPECIALTY

As a beginning, it is vitally important that students now in schools of nursing receive better fundamental preparation in tuberculosis nursing than they have had in the past. In 1937 only 29 per cent of all the students (1,840) graduating from 101 schools of nursing in New York State had had tuberculosis nursing.[13] More affiliations with tuberculosis hospitals during basic training are called for. In those schools which can offer only limited communicable disease experience for nurses, one would say such an affiliation in tuberculosis care was essential. For graduate nurses, refresher courses should be provided, especially for those who have missed this type of experience in their schools of nursing, or who have been long away from the field. Funds for clinical courses in the specialties are even now available (under the Bolton Act) to public health nurses and other nurses interested in this field. In 1943, Mt. Morris Tuberculosis Hospital, Mt. Morris, N. Y. (a state district hospital), "refreshed" ten public health nurses by a 6 week experience, and is repeating the plan this year. Many of the well equipped sanatoria offer unusual chances to nurses for experience in hospital administration. One can picture several of the new county hospitals of 100–300 beds offering very adequate practice fields for nurses specializing in hospital administration.

SAFEGUARDING SERVICE

One point, however, bears stressing: preliminary to promoting tuberculosis hospitals as practice fields for refresher courses or for student experience should come further immediate research into safe nursing technics. Except for the more thorough application of what we knew twenty years ago—tuberculin testing and x-ray—we cannot claim to have discovered any new means which can be relied upon to protect our young doctors and nurses from contracting the disease while caring for open cases. Tuberculosis in young nurses still shows a higher incidence than among other girls in this age group.[14] Nurses still break down

with distressing frequency—and this not alone in tuberculosis hospitals but in general hospitals as well. We are more on the alert to prevent breakdown; we test with tuberculin and examine with x-ray more frequently; experiments with BCG vaccine continue but are far from conclusive and, in the meantime, infections occur. Nor do the infections seem to have much relation to the practice of present-day technics.

Some institutions use masks, gowns, and caps; some gowns only; some depend on good basic hand-washing routines and individual isolation technics for open cases, and yet the infections occur under all conditions. No one *knows* how to prevent tuberculosis among nurses and doctors who must be in fairly constant contact with positive sputum cases. If the portals of entry are solely the nose, mouth, and possibly eyes, is there no device to serve as an effective screen over this limited area? Or may the source of infection during bed rest, at least, be effectively walled off by a curtain of ultra-violet light around a patient's bed?

We have not shown much progress in controlling the environment in which the nurse must work in caring for tuberculosis—all sorts of mechanical devices are still unexplored. Here is a hospital so constructed that nurses, doctors, and ward helpers must manipulate dozens of doors or the same door a dozen times while giving daily care, the same door which the ambulatory patients may use. Is this a situation which an "electric eye" could remedy? Here is a hospital where nurses must overload their dressing and supply carts because patients are not provided with individual equipment; another where scarcity of washstands makes it necessary for the nurse to walk fifty yards to wash her hands. In many hospitals, patients are not grouped according to their infectiousness, partly because ward units are not flexible, partly because of medical preferences. Hence a nurse must wear a gown in certain rooms and not in others; here is a book handled by a positive case; here is a "safe" book—it is little wonder a nurse feels happier when she treats all cases as infectious. The more nurses we have, the greater should be the chance for self-protection, since time may be taken for proper technics and nurses need not be overworked to the point where they grow fatigued, careless, and susceptible to infection.

NEW OPPORTUNITIES FOR SERVICE

It is gratifying to look ahead to the years when we will have ample nursing service in homes, clinics, and hospitals, but it is even more exciting to consider the new opportunities for service. There will be many suggestions for better care of the tuberculous growing out of the abundant life which peace promises; at least four fields—now lying fallow—await cultivation:

1. *Instruction of Patients and Families*—

At the present time, nurses in tuberculosis sanatoria are conscious of gaps in the instructions given by community nurses to patients at home before hospitalization and, when patients return from the hospitals, the community nurses find they, in turn, have to teach some of the lessons which it would appear patients should have learned during their long stay at the sanatoria. There would seem to be a need for a classification of instructions, something that might roughly correspond to graded lessons: certain essentials should be taught in the pre-hospital period, repeated, enlarged, and advanced during the cure in the hospital. While in the hospital and before returning home, a patient should show himself capable of putting certain lessons into practice for the protection of others and the maintainance of his own recovered health. On his return, the community nurse

would carry on the lessons of living safely with others. The supervision of such graded lessons at home, in hospital, and at home again could well be the job of a specially prepared public health nurse, working through the usual staff (hospital) and field (public health) nurses.[15] There would surely be definite improvement in the patient's own understanding and handling of his disease, fewer breakdowns, and, most important perhaps, fewer new cases developing among contacts.

2. *Educational Responsibilities Within the Hospital—*

The opportunity to carry on an educational program within the hospital offers a full-time job in itself. Here a qualified nurse—preferably a public health nurse—would have no less than six possible groups of "students" with which to work:

1. The patients
2. Patients' families and friends who come as visitors, who need far more instruction than they are getting now in self-protection, behavior at the bedside, preparation for the patients' homecoming, and answers to their questions. Many hospitals give the visitors printed instructions. Sometimes these are thrust into the handbag and read a week later, sometimes they are dropped in the ward, sometimes given to families who cannot read, and most frequently they are read, forgotten, disregarded, and disobeyed.
3. Student nurses in affiliation
4. Graduate nurses: new staff and those taking refresher courses
5. Nonprofessional paid help.
6. Volunteers

A versatile teacher indeed is needed for these six groups which represent all grades of intelligence and varying levels of instruction.

3. *Home Follow-Up—*

For the most part, follow-up of discharged sanatorium cases is now carried on by the community nurses—county, local health department, or visiting nurse associations. This is as it should be to avoid a specialized staff and duplication of home visits, but it is also evident that the sanatorium needs a liaison nurse—preferably a public health nurse—who takes over the supervision of service to patients getting ready to go home, sets in motion the community service to the home before the patient returns to it, and is assured that continued service is given the home and patient after the patient's return. This same supervising nurse could also be the one to see that the referring agency received reports of the patient's progress in the sanatorium during his cure. She would be the one to relay questions or problems which disturbed the patient during his cure and, in short, take upon herself many of the duties handled by medical social workers in general hospitals.

4. *Rehabilitation—*

More nurses should prepare themselves to serve in the field of rehabilitation when post-war funds for special education are available to nurses. This is a field which should appeal to many. It is a growing field of service to tuberculosis patients.

Nurses frequently complain that work in a tuberculosis hospital after the first year or two is monotonous and discouraging, forgetting that they have the best possible foundation of training and experience for advanced preparation in some related specialty. The farsighted director of nurses does not let her graduate staff stagnate; she rotates their responsibilities, observes and encourages their special aptitudes. She offers them opportunities to attend outside meetings, visit other institutions, keep abreast of special training opportunities, and she suggests further study when good work warrants it. After the war when pressures relax, may we not see rotation of nurses in wider arcs than in the past? For example, exchange experience between public health nursing

and tuberculosis hospital staffs, between city and country sanatoria, between East and West, North and South—all to the end that patients and families may be better served, understand tuberculosis more thoroughly, and be instrumental themselves in preventing the spread of the disease.

SUMMARY

This article has attempted to show that tuberculosis patients have a first lien on our attention after the war because of (1) their probable numbers, (2) the need to restore adequate care now greatly reduced by staff shortages, (3) the ample supply of nurses. It anticipates an increase in nursing service to tuberculosis patients at home, in clinics, and in hospitals; it urges attention to better protection of nurses from infection, better fundamental preparation of nurses in knowledge and care of the disease, and suggests new opportunities for nursing service in combined hospital and community programs.

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Problem of Control of Tuberculosis in Mental Hospitals with Reduced Personnel*

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THE high prevalence of tuberculosis in institutions for the treatment of mental diseases has long been known. In New York State during the 3 year period 1939–1941, the average annual death rate from tuberculosis (all forms) in the 26 state hospitals for the mentally ill and defective was 593.6 per 100,000 population, as compared with the average rate of 46.8 for the state as a whole. Although the patient population of these institutions during this period represented only 0.6 per cent of the entire state population, it accounted for 8.1 per cent of all tuberculosis deaths.

While no complete statistical data were available regarding the tuberculosis morbidity in these institutions, isolated studies made in recent years gave sufficient evidence to warrant the conclusion that morbidity among mental patients is far in excess of that found in the general population.

For years the State Departments of Health and Mental Hygiene had recognized the seriousness of this situation and the need for corrective measures, but it was not until 1941 that a complete study became possible, chiefly because of the realization of the increasing cost to the state for compensation for tuberculosis to employees of the state mental hospitals.

The two departments, therefore, agreed to undertake the development of a control program based on the following points:

1. X-ray examination of all individuals, patients as well as employees, in each institution
2. Segregation of all patients found to have clinically significant tuberculosis
3. Referral to tuberculosis hospitals of all employees found to have clinically significant tuberculosis
4. Routine x-ray examination of all new patients and all candidates for employment
5. Periodic x-ray examination of employees assigned to duty in tuberculosis wards
6. Periodic resurveys of all institutions
7. Basic training in tuberculosis to be given in the state tuberculosis hospitals to members of the medical and nursing staffs to enable them to carry on the program in each hospital
8. Development of facilities for the treatment of tuberculous inmates, particularly of those whose mental condition would warrant their early discharge
9. Establishment of a system of records which would provide clinical, epidemiological and statistical data

* Presented before the Epidemiology Section of the American Public Health Association at the Seventy-second Annual Meeting in New York, N. Y., October 12, 1943.

Inasmuch as the fluoro-photographic method had proved itself economical as well as practical for mass x-ray studies, two 4″ x 5″ fluoro-photographic units were purchased and the necessary staffs for their operation were appointed. The x-ray surveys were started late in the summer of 1941 and have been continued for the past two years.

As in the case of almost all other civilian activities, this program also has been adversely affected by the war situation and the resulting man power shortage. Although most eager to cooperate with us in the development of the plan, the Mental Hygiene Department authorities have been wholly unable to carry out some of its provisions, principally because of the lack of trained personnel and the increasing turnover of employees. How serious the personnel situation is, is indicated by the fact that on April 1, 1943, the beginning of the fiscal year, there were 5,559 vacancies among the 22,147 positions available in all the mental institutions, and that in nine hospitals, which normally would have a total of 7,758 employees, no less than 3,809 candidates for employment were examined during the twelve months following our first x-ray survey.

Under the circumstances, it was inevitable that some phases of the program had to be either modified or postponed until such a time as the situation became normal again.

For instance, the almost daily shifting of employees from ward to ward, as a result of vacancies, has made it impossible to carry out the plan of establishing permanent staffs of nurses and attendants for the tuberculosis wards and of giving them the specialized training necessary to take care of tuberculous patients who are mentally irresponsible. Such a step not only would have made possible the application of proper prophylactic measures in the tuberculosis wards and the periodic reëxaminations of these employees, but, together with the concentration of all infectious cases in a few hospitals, would also have reduced the total number of employees exposed to tuberculosis. Nor has it been possible to give any consideration to the plan of offering graduate training in the state tuberculosis hospitals to physicians of the mental hospitals in order that they may assume, in collaboration with the Division of Tuberculosis, the task of continuing the application of control measures and of eventually developing a well rounded program for the study and treatment of the tuberculous patients.

However, in spite of these handicaps, steady progress has been made toward a clear definition of the tuberculosis problem in the mental institutions and of the steps necessary for its solution. It is felt, therefore, that sufficient information is now available to warrant a brief report of the most significant results of these two years' activities.

As of August 31, 1943, surveys had been completed in 23 state hospitals and state schools during which a total of 82,586 patients and 16,716 employees had been x-rayed. Still left to be surveyed are 3 hospitals with a total of approximately 9,000 patients and 1,400 employees.

Analysis of the findings among the 68,743 patients x-rayed in the first 20 institutions shows that 3,220, or 4.7 per cent, had x-ray evidence of clinically significant tuberculosis, while an additional 3,151, or 4.6 per cent, had tuberculous lesions which from the roentgenologic point of view could be considered as apparently healed.

The prevalence of clinically significant tuberculosis was not uniform in all institutions, ranging from a minimum of 0.4 per cent in one state school to a maximum of 8.0 per cent in one state hospital, the average being 5.3 per cent among patients of the mental hospitals

and 2.4 per cent among patients of the state schools for mental defectives. In the total group the rate for men was higher than that for women, 5.3 per cent as compared to 4.1 per cent.

In formulating the program it had been intended that all patients with clinically significant tuberculosis should be segregated, and that, if possible, this should be accomplished by concentrating them in a few of the better equipped and more centrally located hospitals. However, it soon became apparent that this plan could not be carried out completely. On the one hand the number of patients requiring segregation proved to be larger than expected, while on the other, shortages of equipment and materials made it impossible to effect the necessary alterations and improvements in the hospitals selected for this purpose. Up to the present time it has been possible to concentrate only 1,412 of the 3,220 tuberculous patients in 3 hospitals, while for the segregation of the remainder it has been found expedient to utilize whatever facilities for isolation were available locally in the other hospitals.

Among the 14,228 employees of the 20 institutions first surveyed, 156, or 1.1 per cent, showed x-ray evidence of clinically significant tuberculosis, 1.3 per cent of the men and 1.0 per cent of the women. An additional 359, or 2.5 per cent, had apparently healed lesions. The finding of 1.1 per cent with significant tuberculosis among mental hospital employees indicates that there is almost twice as much tuberculosis in this group of workers as in other general industrial occupations.

The original program provided that employees found to have clinically significant tuberculosis were to be referred to the state, county, or municipal tuberculosis hospitals of their legal residence for further diagnostic study and treatment if necessary. However, the experience of the past two years in securing prompt hospitalization has been rather disappointing due to problems of residence, domestic and financial difficulties, and the unwillingness of some of the employees to enter local tuberculosis hospitals. Therefore, ways and means should be found, probably through legislation, to afford these employees an opportunity for immediate hospitalization as state charges. It is to be noted that the State of Michigan has recently enacted legislation to meet similar needs in that state.

Routine x-ray examinations of all newly admitted patients and of all candidates for employment have been established in every hospital after the original survey had been completed, the patients found to have clinically significant tuberculosis being segregated soon after their admission.

Analysis of the findings among 12,794 first admissions to 20 hospitals and state schools shows that 351, or 2.7 per cent, entered the institution with clinically significant tuberculosis, 3.9 per cent of the male and 1.6 per cent of the female patients.

Among the first 5,735 applicants for employment who were x-rayed, 61, or 1.1 per cent, were found to have clinically significant and 203, or 3.5 per cent, apparently healed tuberculosis. The applicants of the first group were referred to the proper health authorities for further follow-up.

It will be noted that the prevalence of clinically significant tuberculosis in this group of prospective employees is as high as that found among the old employees and again twice as high as that to be found in the general population. Further analysis of the information available will be necessary before this fact can be fully explained. However, it should be remembered that with the armed forces and better paying industries drawing the best of the available man power, the mental institutions

have been obliged to pick much of their personnel from lower socio-economic groups among which the incidence of tuberculosis is known to be higher than the average. Many of the new employees, particularly men, are in the older age groups, and recently an appreciable number of them have been coming from the South. In this respect it must be noted that while 1.6 per cent of the male applicants were found to have clinically significant tuberculosis, the rate was only 0.6 per cent among the female applicants, which group has been less affected by the war conditions.

Although the shortage of personnel has prevented the completion of the primary surveys in all institutions, resurveys are being started wherever possible. One such resurvey has just been completed in a state hospital and a preliminary analysis of the results shows that 23 new cases of clinically significant tuberculosis had developed among 2,275 patients who were first x-rayed two years ago, that is an incidence rate of 1.0 per cent in two years. It is obvious that the segregation of all the infectious cases found in any given environment as a result of a single survey will not prevent the occurrence of new cases in that environment. Therefore, it is necessary to reëxamine the populations in these institutions at regular intervals, the frequency of these resurveys to be determined by the results of those now being conducted.

These surveys have produced a wealth of clinical and statistical data which when completely analyzed and correlated should contribute to our knowledge of the epidemiological and clinico-pathological aspects of tuberculosis and its relationship to mental diseases. So far, our study has served the purpose of outlining in definite terms the magnitude of the tuberculosis problem in the mental institutions.

Continuing and more detailed observations will be necessary before determining the factors which are more directly responsible for the high prevalence among the patients. Certainly, the theory advanced by several psychiatrists and supported by some statistical evidence that a specific biologic relationship exists between schizophrenia and tuberculosis cannot be discounted altogether. That not all the cases of tuberculosis found among the patients develop as a result of infection contracted during their residence at the hospital, is indicated by the fact that 2.7 per cent of them already have clinically significant lesions at the time of their admission, a much higher prevalence than that in the general population. It is interesting that as early as 1909 Gantner noted that many schizophrenics had tuberculosis before their admission to the hospitals.

On the other hand, close and prolonged contact, which is unavoidable in mental institutions, lack of appropriate prophylactic measures, and the inability of many of these patients to carry out minimum sanitary precautions, are other factors which must play an important part in the spread of the disease. Our experience shows that the prevalence of tuberculosis is directly related to the length of residence in the hospital. Only 2.8 per cent were found to have clinically significant lesions among the patients with less than 6 months residence in the mental hospitals as compared to 6.6 per cent among those with more than 5 years residence.

Whatever the causes, it is evident that measures to improve the situation have been long overdue and that they should be fully applied as soon as conditions permit. This should be done not only as a matter of duty to the patients and to the employees who care for them, but as a matter of basic public health policy.

The high prevalence of tuberculosis in 26 mental institutions deserves as

much attention as would a comparable prevalence in 26 other communities in the state.

It is known that up to 1941, the total number of new cases of tuberculosis diagnosed and reported every year had shown a general downward trend, the average annual decrease in New York State between 1936 and 1941 being 386. Less known is the fact that an increasing number of patients are being discharged every year from the mental institutions, particularly as a result of a wider application of shock therapy methods and of the system of paroling patients to family care. In 1941, 10,505 patients were discharged, and if the prevalence of tuberculosis among them was the same as that obtaining among the patients in the institutions, nearly 500 cases of clinically significant tuberculosis, many of them being unreported because unknown, were introduced into the communities and homes.

It is evident that mental hygiene hospitals make up one of the major reservoirs of tuberculous infection. Public health and hospital administrators cannot afford to ignore this fact.

NOTE: All the statistical data were compiled and analyzed by Mary E. Thompson. Her invaluable assistance and advice in the preparation of this paper are gratefully acknowledged.

Modern Hospital Competition

To encourage the building, in areas where they are needed, of small hospitals that are efficiently arranged, suitable for smaller communities, creditable in architecture, simple in design, in good taste, economical to build, to operate and to expand and that make maximum use of the best ideas in planning and construction; to *furnish* to the trustees of small hospitals ideas that will stimulate them to provide better accommodations, *and to encourage* architects to give more attention to the designing of good small hospitals and community health centers, The Modern Hospital Publishing Company offers six awards in each of two competitions

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Health Education in Nutrition*

Adapting Business Promotion Technics to Public Health Education

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THERE is a tool on the desk of the American business man which should be carefully examined by health educators the country over, because it could be of great service to health education if adapted to meet public health needs. That tool is promotion. Some educators have been hesitant to use it, thinking its bite is too sharp or perhaps too superficial. Yet if skillfully used, business promotional technics can be adapted to health education to further a cause or a program just as effectively as they are used in business to promote a product, a person, or a company.

Timing is one of the most important factors in the use of promotion. One must reap a full harvest of public opinion, and then the cause or program gains momentum rapidly, especially when there is real need in the community for the education presented. Promotion can offer a short cut to the objective. But this is not enough. Results become tangible and deeply rooted only if this promotion is skillfully coördinated with painstaking follow-up instruction.

Since the European war began no health program has been in the limelight so prominently as nutrition, and certainly none has benefited more from favorable public opinion. Yet the American consumer was not ready when the nutrition crisis came. When the need for rationing arose in the United States, fear amounting almost to panic seized the home front. To the average consumer, rationing meant reduced standards of living and some imagined a state of slow starvation. Now, after a period of rationing, the consumer is thoroughly conditioned by education and experience. The public may not have had all the varieties of food it wanted in 1943, but it had plenty of healthful food. This has been due in great part to the nation's farmers, who are winning the battle of food production. The nation's per capita consumption of all foods in 1943 was approximately 5 per cent above the 1935–1939 level, and was richer in essential nutrients.

No small element of success on the food front has been due to the instruction of people to eat the foods that their bodies require. In every American community, nutritionists, health educators, dietitians, farm agents, home

* This study was carried out under the auspices of the Kips Bay-Yorkville District Health Committee of New York City in conjunction with the Department of Public Health and Preventive Medicine, Cornell University Medical College.

The authors acknowledge the assistance of the members of the staff of these organizations, of the Department of Health, of the many community organizations, and of the lay and professional volunteers who made the project herein described possible. They are particularly indebted to Dr. W. G. Smillie, Professor of Public Health and Preventive Medicine, and to Mrs. William S. Ladd, Chairman of the District Health Committee.

demonstrators, school teachers, home economists, public health nurses, housewives, volunteers from all walks of life have instituted what may be termed as an all-American nutrition education campaign. Nutrition has had a field day. Hardly a hamlet in the country has been untouched.

Some programs have been more effective than others. Where some have failed, others have succeeded, and sometimes the results have been unusual. A notable example is the program in the Kips Bay-Yorkville area in New York City in which business promotion technics were utilized in carrying out its projects. Here 245,000 people reside in the heart of Manhattan, 45 per cent of them, in normal years, earning less than $1,200 annually. The district, with its penthouses on Park and Fifth Avenues, its slums on First and Third Avenues, has the greatest income differential of any area of comparable size in our nation. Here is a cross-section of many nationalities, of many professions and trades, of rich and poor, of families and single boarders—in short, an ideal test tube for any health program because it contains so many and so varied characteristics of the typical American city.

The nutrition program began in January, 1942—a month after Pearl Harbor. It began in a citizens' health committee which is attached to the local health center. This center houses the municipal Department of Health staff and clinics for the district, a medical college's department of public health, and several voluntary health and social agencies. The health center is affiliated with an adjacent large hospital and medical school. Donated funds only were available for the program, so it began on the proverbial shoe string.

The staff consisted of a community organizer from the field of business promotion, one nutritionist,* a part-time sociologist who was making other studies in the district, and an office secretary. But soon the volunteers began to come—and to stay—for there was real work for them to do and their various talents were to be used in this citizens' program. Soon 156 were recruited—among them 26 professional nutritionists, home economists, and dietitians.

The first trial was the organization of nutrition classes for the low income groups, but dwindling attendance finally brought the realization that the people were uninterested. They were not applying in their homes the information that the professional volunteers were so painstakingly giving. Lectures and classes apparently were not the proper technic for this group. What would work? What, in the business vernacular of the community organizer, would overcome the sales resistance to nutrition? So nutrition classes were abandoned.

Each group of people to be reached by the program must be carefully analyzed to discover what their special interest in nutrition might be. Only after this special interest was determined, were plans laid. All plans must be designed to capitalize those *special interests*. A separate promotion was developed for each group—and then results came. Department store personnel, railroad men, high school girls and housewives who shopped in the city's public market all had different programs. An evaluation of these programs showed that they had affected the eating and food buying habits of each specific group.

NUTRITION FOR DEPARTMENT STORE PERSONNEL

One of the outstanding successes of the program was the department store

* All educational materials were approved by trained nutritionists.

promotion; so let us look at that project in some detail to see what made it successful. First, what was the special interest of the worker? Second, how was it turned for the benefit of nutrition?

Department store personnel are divided into two classifications: selling and non-selling. The sales girl is much more impressionable, more gregarious too, than her non-selling sister. She is interested in her customers and she admires those who dress nicely. She is "geared to glamor," both in her training and in her thinking. But her non-selling sister behind the scenes, at desks, in fitting rooms, in stockrooms, and in offices, is governed by an entirely different psychology. Usually she is suspicious of ultra-glamor, she admires the plodder, and she goes all out for wholesome sincerity.

Nutrition was sold to approximately 8,000 department store workers at Bloomingdale's, Saks Fifth Avenue, Bonwit Teller, Sterns, and Jay Thorpe by a program cut along lines to fit the psychology detailed above. A single lecture, only 30 minutes in length, plus clever merchandising of nutritious food in some of the employees' cafeterias did the trick. Glamor galore was presented in the lecture for the selling personnel, and wholesome sincerity for the non-seller. It was in stressing the relationship of proper eating habits to the skin, the hair, the nails, and the eyesight that the speaker seemed to ring the bell with the sales girl. By emphasizing nutrition's importance to good eyesight, good health, and high morale, the speaker won the non-seller. In both presentations, volunteer speakers passed along, with conviction and enthusiasm, the basic facts which nutritionists had agreed were essential to good health.

Simultaneously with the lectures, Nutrition Bars were opened in some of the employee cafeterias. Questions at lectures had revealed other special interests:

> "What can I eat to get thin?"
> "What can I eat to get fat?"

Immediately those interests were turned to benefit nutrition. "Watch-your-figure" and "builder-upper" trays were offered at the Nutrition Bar. Results were excellent.

Consumption of milk doubled in most stores, and sales of whole grain bread doubled. Consumption of fruit and vegetables jumped 25 per cent in one store, slightly less in the others. At one cafeteria, 8 times as much tomato juice was consumed after the lectures. Everywhere there was a decided decrease in tea and coffee.

AN APPROACH FOR THE RAILROAD MAN

It may well be argued that the glamor presentation is a "natural" for the department store worker; so let us look at the opposite end of the yardstick—the railroad man in his Y.M.C.A. He, too, has his special interest. He is concerned about the fatigue which often sets in before his run is finished, about his arthritis, and his eyesight which is not so keen as it once was.

For this group an evening meeting was planned which combined a nutrition motion picture, "Hidden Hunger," with one of the top-flight volunteer glamor speakers whose enthusiasm for nutrition springs from the fact that proper nutrition helped her through a very serious illness. Skillfully emphasizing some points of the motion picture, such as the sequence dealing with the truck accident due to night blindness, the speaker went on to prove that raw vegetables can be "delicious as well as nutritious." She passed around the audience a huge salad bowl of twelve different raw vegetables, so that sample tastes could be speared out with toothpicks. The bowl came back clean as a whistle, and after the lecture the

question and answer period developed into a lively informal discussion which lasted an hour and a half.

In the Y.M.C.A. cafeteria there was an instantaneous increase in the demand for milk and fruit. The most popular item on the menu was a mixed raw vegetable salad named in honor of the volunteer speaker. Again it was nutrition in relation to the special interest of the railroad man, plus dramatic visual aids, which put the subject over. In other words, "What does it mean to me?"

THE ADOLESCENT GIRL BECOMES INTERESTED IN BETTER NUTRITION

How should one present nutrition to the high school adolescent girl? She is usually thoroughly exposed to nutrition theory in her hygiene, home economics, and health education classes, but only too often she disregards what she has been taught, when left to her own devices to choose her meals. "Nutrition via Hollywood" hits the special interest of the adolescent girl, as proved by an experimental project which the committee undertook in Julia Richman High School, one of the largest schools in the city.

Again a glamor speaker, looking very much as though she had just stepped off a Hollywood set, drew the major part of the assignment. She had just returned from Hollywood where she had wined and dined with the glamor people, and her pockets were crammed with information about what they eat to keep fit for their strenuous work before the camera. The other speaker, beautiful and glamorous, did not have this first hand information; so she fortified herself with wires and letters from favorite stars of the high school girl:

"TELL THE GIRLS AT JULIA RICHMAN HIGH SCHOOL FOR ME THAT THE ROAD TO CHARM IS ANIMATION, GOOD HEALTH, GOOD LOOKS VIA FRUIT, VEGETABLES, EGGS AND MILK
DOTTIE LAMOUR"

Six such wires and five letters, all messages to the students from top-flight stars, accented the glamor appeal of the 30 minute assembly lecture. Six assemblies were held to reach the total student body of approximately 5,000 girls. Once again the salad bowl proved itself a powerful visual aid; this time as the "salad bowl act," designed for dramatic audience participation. At each lecture, three volunteers from the student audience came to the stage to be blindfolded by the speaker and to taste the now famous raw vegetable salad. One girl was given a taste of raw spinach, another raw cauliflower, and a third raw broccoli. Signs were held up to inform the audience what vegetable was being tasted and the squeals and laughter which greeted them were electrifying. None of the volunteer tasters could guess correctly what vegetable she had eaten, but all assured the audience that the salad was "perfectly delicious." Obviously the audience was convinced. As soon as the lecture was over there was a surge to the stage and in less than 3 minutes the huge salad was entirely consumed.

Directly outside the assembly hall is the school's large, impressive foyer, and this housed a colorful exhibit put up by the committee. Its theme was "Look Your Best—Feel Your Best—Do Your Best—Through Proper Eating." The well balanced 3 day diet was portrayed in a dramatic manner with menus illustrated through the use of colored vignettes cut from magazines, can labels, and photographs. The morgues of two leading women's magazines and the files of three food canners supplied much of the exhibit material. Photostatic copies of the Hollywood wires and letters were framed on the walls with red tape for all to read. Four

live rats from Cornell Medical College's laboratory, in special exhibit cages, added a dynamic touch to the exhibit. When the properly eating rats, named Julie and Richy for the school, produced quintuplets on the 5th day, nutrition became of added interest to the biology classes and a poem appeared in the school paper commemorating the event. The undernourished rats were dramatic, visible proof to all that an inadequate diet affects the eyesight, stunts the growth, ruins the hair, causes nervousness and listlessness.

Borrowing the successful cafeteria technic from the department store promotion, model trays were made up from the daily menu and these were sold to the students with catchy little word signs, such as "For Charm Specific This Tray Is Terrific," or "Choose This Tray for the Glamor Way." Other colorful signs quoting excerpts from the stars' messages were scattered around the cafeteria walls, additional reminders that proper eating is important to good health, good work, good looks.

Careful planning and timing helped immeasurably in the success of this high school project. The committee's planners met weeks in advance with the home economics chairman of the city's board of education, the principal of Julia Richman High School, and other staff members, including heads of the departments of home economics and health education, and the manager of the school's cafeteria. Details of the plan were perfected in a series of meetings, and when all was ready, the plan was presented to the faculty at one of its monthly meetings. Three weeks later the program opened in the school, and throughout its operation it was backed by excellent support and cooperation from the entire faculty. For three weeks following the assembly lectures, 17 teachers of the health education department concentrated on teaching nutrition from an outline especially prepared by the Kips Bay-Yorkville committee's professional specialists. Original visual aids, quizzes, and carefully chosen literature were used to supplement the follow-up teaching, which proved to be one of the most important parts of the program.

Again, using a cafeteria base as an observation post, it was determined that results which were secured were substantial. Penny milk is supplied to New York public schools, so milk consumption was limited by the supply available. However, a 66 per cent increase in the consumption of milk was registered in the teachers' cafeteria. Salads, especially mixed green salads which had never been popular with the students, soared into the lead as the most popular food. The demand instantly doubled, climbed steadily until six weeks later four times as many salads were being consumed. With a difficult commodity market in greens at the time, the cafeteria manager could not keep up with the demand of the students. Consumption of whole grain bread doubled. Pastry decreased 25 per cent. Candy, previously the money maker for the cafeteria, decreased 50 per cent. Yet the cafeteria proceeds soared, a daily increase of $25 overnight, then $30, and at the end of six weeks $50.

Radical changes in eating habits proved undeniably that utilization of a special interest was the quickest way to emphasize good nutrition to the adolescent girl so forcefully that she would actually apply the theories to her daily life. Boys, on the other hand, pooh-pooh the glamor approach, for they have a set of special interests peculiarly their own. The air corps, the marines, the army, the navy are all timely pegs, each suggesting endless possibilities for dramatic nutrition promotion for boys. Again, "What does it mean to me?" Baseball is another peg, an ageless special interest for boys.

Sometime a clever nutrition speaker with a flare for showmanship might visit some of the training camps, hob-nob with the baseball men-of-the-year at their training tables, then come back to give the adolescent boys all over America some of the real dynamics of nutrition.

THE HOUSEWIFE CHANGES HER BUYING HABITS

The Kips Bay-Yorkville program was successful in teaching nutrition to the low income groups by the indirect selling method right at the point of sale, whereas it had failed in classroom teaching during the first six months of the program. The committee anticipated that rationing would prove a great boon to nutrition, in fact that it would open wide the door for sound nutrition education, because rationing was the timely special interest of every adult. Therefore, at the request of and with full coöperation of the Department of Markets, the committee opened a Food and Rationing Information Center in a new public market. The formal opening, timed to the distribution of Ration Book No. 2, was ballyhooed sufficiently to make front pages in New York papers, in itself a five-star achievement.

Many community resources made this project possible. New York Hospital loaned a full-time nutritionist for six weeks to train the staff of 20 volunteers, nutrition aides recruited to staff the center in the market. Saks Fifth Avenue sent an ace display man to decorate the seven windows on the street, and an art student painted a 40 foot mural, as a class project, which was hung on the wall above the center. Bloomingdale's department store donated furniture and thoughtfully sent potted plants for the opening. A neighborhood cabinet maker made and donated special display fixtures.

After its widely publicized opening, the center and its volunteer staff went quietly about its business of nutrition education. Weekly the staff met with the committee's specialists to discuss the problems of the housewife and to receive the latest information available on rationing and nutrition. Staff members were given specialized training in the use of visual aids. Through constant shifting of all displays the consumer was drawn into the center each time she did her marketing to see what was new. Special motion pictures on nutrition, usually with a speaker, were scheduled for Friday and Saturday, the peak shopping days in the market. Mimeographed releases of menus and recipes were passed out regularly, together with carefully chosen literature. Hundreds upon hundreds of questions on rationing and nutrition passed across the volunteers' desk and a careful record of these has been kept. With their constant association with the consumer and their highly specialized training at the hands of the committee's professionals, each member of the center's staff became adept at handling the public.

It is certain that the center does its job well, although this project lacks the cafeteria-like yardstick. One of the district's settlement house directors reported: "The women of our Mothers' Clubs have learned more nutrition from those market windows and interior displays than they did in their classes last winter." That is a real tribute to the effectiveness of the visual aid as a teaching technic. Another community leader said: "The Center in the public market is the finest service offered to the people of our district. We hope it is here to stay."

It is. The center has already celebrated its first anniversary. From the people themselves, many of whom return to the center at least once a week, the volunteers discover that they are learning and applying nutrition prin-

ciples; furthermore, that they have mastered the problems of rationing with their own resourcefulness at substituting the correct foods when scarcities occur or when lack of points forbids favorite items.

The key to the success of this project is a universal special interest—rationing. However, located as it was right at the point of sale, the center took strategic advantage of the rationing program to drive home the principles of good nutrition.

We have made a detailed examination of only four of a dozen or more projects undertaken by the Kips Bay-Yorkville committee. These four projects prove that promotional technics can serve as an excellent plow with which to condition the field for planting. There is no magic formula, other than the fascinating magic of ideas. Nor is the cost prohibitive. Any community can follow the path of the Kips Bay-Yorkville committee. The pattern they applied to nutrition will fit other health programs just as well.

The program ran for 20 months. The actual operating expense for the entire period, including salaries, was less than $9,000—for a total population of 245,000.

The key to this almost phenomenally low operating cost was the marshalling of all community resources to aid the program. Materials and services were generously donated by advertising agencies, department stores, food stores, chains and manufacturers, by the newspapers, magazines, and radio networks, by the medical school and the college in the district, by the Junior League, the Chamber of Commerce, the Department of Health, the Department of Markets, by the hospitals, the hotels, the churches, and the libraries. To cite a single example: Original posters and small stickers were needed for the food store promotion. Two advertising agencies within the district created the designs, one of the leading food chains printed the posters on their own presses, while another paid the printer's bill for the stickers. On this job alone the committee spent $60 of its own money, but received hundreds of dollars worth of promotional material.

In the truest sense, the Kips Bay-Yorkville District Health Committee's nutrition program was a community-wide program made possible by community-wide participation. As such, it may serve as an example to other health programs throughout the country.

CONCLUSIONS

This study of the utilization of business promotion technics in public health education, which was applied to nutrition by the Kips Bay-Yorkville District Health Committee of New York City, demonstrated conclusively that the skillful use of tested business methods can be adapted with great success to the needs of a health education program in a typical American urban area.

But the business man will not stop with promotion. He realizes that promotion has its work to do, but he follows up the promotion with a detailed, carefully laid merchandising plan and uses trained technicians to check the facts he wishes to "sell." This principle can be applied in public health education. But promotion methods, if applied alone, are superficial and will be ineffective. They must be accompanied by a continuing and well balanced educational program.

Gonorrhea Contacts—Criteria for Management*

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IN the contact reports of the armed forces, civilian health departments have today the richest source of such information in the history of our attempts to control gonorrhea, information which can be utilized as a powerful tool for the eradication of the disease. Since the significance of such an effort depends upon the prevalence of this infection, it may be in order to consider our information on this point.

Although reporting of gonorrhea is required by law, we have no certain assurance that it approaches completeness in any degree comparable to that of syphilis. The follow-up for a case report in syphilis is dependent upon the routine transmission of copies of the serological report to the health department. Even in the present day of selective service examinations, approximately 88 per cent of persons found to have had serologic reactions for syphilis are ultimately reported as cases. It is taken then that syphilis case reports fairly represent the degree to which this disease is diagnosed. But since cultural examination is not indispensable in the uncomplicated case of gonorrhea, and the smear may be examined by the physician himself, no such follow-up of positive laboratory reports has been pursued in this disease. However, it may be possible to apply our more accurate knowledge of syphilis morbidity to gonorrhea case reporting, in an effort to assay its completeness.

Although only 42,153 case reports of gonorrhea were received in the New York State Department of Health between 1936 and 1942, during which period 105,908 cases of syphilis were reported, it is not felt that this, the usual comparison, is a sound method of estimating the completeness of gonorrhea reporting. Since the Neisserian infection terminates within a period of one year in most cases, either through treatment or spontaneous cure, the number of case reports collected during any year describes the discovery of new cases, while the number of cases of syphilis reported in any year depends upon incidence in past years as well as in the current one. A truer parallel to the number of gonorrhea reports is the number of cases of syphilis of less than one year in duration discovered in a similar period. Though there is an admitted discrepancy in such comparisons in the greater probability of a gonorrhea patient, particularly the male, presenting himself for diagnosis, the number of cases of gonorrhea and early syphilis can be compared with profit if this reservation is kept in mind.

Between 1936 and 1942 inclusive an average of 1,480 case reports for early syphilis were received per year compared with an average of 6,022 gonor-

* Presented before the Epidemiology Section of the American Public Health Association at the Seventy-second Annual Meeting in New York, N. Y., October 13, 1943.

rhea case reports pertaining to the same population group. During the last three years of this experience an average of 609 males were reported per year as cases of early syphilis, compared with 4,057 male gonorrhea cases. This ratio, 6.7 times as much gonorrhea as early syphilis among males, compares very favorably with the ratio of syphilis and gonorrhea among the military quartered in upstate New York in recent years, among whom gonorrhea was 4.5 times as prevalent as syphilis. With this relationship in mind, let us review our data concerning gonorrhea reporting.

In 1936 and 1937 approximately 8,000 cases of gonorrhea were reported each year to the Health Department. By 1940 the number had declined to approximately 5,000, from which level there has been no significant variation. Despite the correspondence between the proportions of reported gonorrhea and early syphilis, it is not maintained that the cases reported in upstate New York represent all the gonorrhea occurring in the population, for the number of reported cases of early syphilis are merely a fraction of the number which actually occur—that fraction seen, diagnosed, and reported by physicians. Nevertheless the correspondence between the ratios observed among members of the armed forces and that among New York State civilians suggests that the latter figure may be a reliable indication of the trends of this disease.

It is significant that four of every five cases reported to the New York State Department of Health have been in males. If the number of cases is actually the same in each sex, there were more than 2,800 cases of gonorrhea in women undiagnosed in upstate New York in 1942. This relative infrequency of diagnosis in the female makes for a great reservoir of infection in the population. It is submitted that we cannot hope to control the disease unless these women are found and treated to the point of noninfectiousness.

But control is hampered at every turn by our difficulty in identifying the infectious case with certainty, particularly in the female. The development of methods of delayed incubation of the gonococcus culture seemed to have been one of the answers to this problem, but it is now apparent that this tool, though a valuable one, does not meet the necessities of a program largely dependent upon the private physician for the following reasons:

1. The culture will not be utilized when the diagnosis of gonorrhea is "ruled out" solely upon the absence of physical signs.
2. The manner of securing specimens must be taught in detail—instruction to which some physicians are not receptive.
3. Patients from whom specimens are taken will sometimes fail to return for therapy.
4. The organism will not be found in an undetermined proportion of actual cases or carriers.
5. The provision of facilities for delayed incubation entails a large overhead expense, even when few specimens are collected.

During these war years we have an unprecedented opportunity to identify and render noninfectious that most important vector of gonorrhea, the promiscuous female with an undiagnosed infection, through the contact reports of the armed forces. But it has sometimes seemed an unprofitable expenditure of time to follow up these reports, find the contact, and guide her to a physician, either in clinic or private practice, only to have treatment withheld because of the absence of signs sufficient to warrant a diagnosis or because the smear or culture was negative. To be sure, some of these women are admittedly free of infection by reason of mechanical or chemical prophylaxis, or simply through errors in securing contact information, but many have subsequently been shown to be infectious cases either through repeated cultural examinations or further con-

tacts with men who subsequently developed evidence of infection within the usual incubation period. After all, so far as contact information is accurate and complete, we have the best evidence of infection obtainable, a positive animal inoculation.

To meet this problem, sulfathiazole is distributed by the New York State Department of Health without requirement of case reports or other identification of the patient. With the drug is included a circular of instruction, advising its use in the female contact as follows:

"Evidence gathered by contact investigation indicates that gonorrhea may exist in a transmissible stage even though physical signs and laboratory tests are negative. Since this situation obtains most frequently in female patients, it is suggested that women who have been in sexual contact with a known case of gonorrhea within one week prior to the onset of his symptoms, or at any time thereafter, receive a full course of treatment when

"(1) the woman named as a contact admits her exposure;
"(2) any woman is named by more than one patient in whom diagnoses of gonorrhea have been made;
"(3) any woman named as a contact has physical findings suggestive of the disease, although laboratory findings are negative.

"It is not suggested that a diagnosis of gonorrhea be made upon these bases, but that treatment is indicated as the safest course of action, in view of the infrequency of reactions to the drug in the recommended dosage."

These criteria are also advised verbally when the contact found by investigation is referred to a local clinic or to her physician. Thus far, these recommendations have been well received by the medical profession. While the culture remains useful in the contact not well identified, and in routine diagnosis, its greatest value is in the determination of the success of therapy. At such a time repeated examinations may be made with less probability of interim transmission of disease than before therapy is initiated.

Though we still have to find the final solution of the gonorrhea problem, it is felt that these simple rules, if widely accepted, can accomplish more toward the reduction of this infection than more cumbersome methods.

SUMMARY

Four of five cases of gonorrhea reported in upstate New York are in males. This suggests a reservoir of undiagnosed and untreated cases in the female.

More intensive case finding measures should be applied to the female population. The contact reports of the armed forces are a valuable index to the infectious female case.

In practice, the gonococcus culture is a cumbersome tool for case finding. Its greatest value is in determining whether therapy has been successful.

A method of influencing the physician to treat the female contacts of known cases of gonorrhea upon epidemiologic evidence only is described.

Proposed Report on the Educational Qualifications of School Physicians*

I. General Scope of the Field

A. *Specific Contributions to Public Health*

School physicians have always had unique opportunities to improve the health of children and communities. For many years, however, the most important function of the school physician was regarded as the physical examination of pupils. Today he has responsibilities of a much broader nature. Although not responsible for medical care of individual children, his responsibilities do include a thorough knowledge of:

1. The growth and development of normal children
2. Diseases of children
3. The values, methods and limitations of advisory service to parents, teachers, school administrators, and pupils concerning the promotion of optimum growth and development
4. The over-all school program and the types of adjustment which are possible and necessary for health reasons for some children
5. Methods of coördinating the medical and nursing services and other school health work with classroom instruction, physical education and recreation, lunchroom and nutrition services so that he may assist all school personnel to make their most effective contribution to optimum pupil health
6. The facilities available for treatment in the community (chief of which is the private physician)
7. The technics of explaining to the parents, child, and teacher the reasons why good health practices are desirable and why treatment is necessary
8. Individual and community health problems which may be attacked through education
9. The place of the school as an integral part of the community's health resources

These modern functions of the school physician enable him to contribute much more to the health and welfare of children and of the community than did the medical examiner or inspector of past years. They necessitate, however, special educational qualifications over and above the M.D. degree. The purpose of this report is to describe this broadened concept of the school physician's functions and suggest the training and experience necessary.

B. *Future Outlook*

With the increased public attention being given child health, public health and education authorities face greater demands for further development of school health programs. Well qualified medical leadership is essential to sound school health work in both private and public schools.

C. *Number Engaged in this Field*

There are probably well over 5,000 physicians in the United States who give either part-time or full-time service to schools. During the past 25 years the number of full-time physicians in schools has increased considerably.

* The Committee on Professional Education of the American Public Health Association publishes this report before transmittal to the Governing Council in order to permit the members and Fellows of the Association to review it and to offer criticisms and suggestions in the further consideration of the report. This report, like all other statements of the committee on professional and technical qualifications in public health, is subject to periodic revision in order that it may be kept abreast of the best thought.

D. *By Whom Employed*

School physicians may be employed either by the board of health or the board of education, or jointly by both. In some states the law requires that boards of education employ school physicians. In other places the board of health is legally responsible for school medical work. In some localities the board of education contracts with the local health department for school health work, including the employment of physicians, nurses, and sanitary inspectors. In other localities the school medical director is employed jointly by the board of education and the health department. He may be the director of the bureau of maternal and child health in the health department. In smaller communities the full-time health officer is sometimes designated school medical director.

E. *Promotional Progress*

Opportunities for advancement in this field occur through promotion from subordinate to administrative positions, by moving from smaller to larger school systems, by promotional progress through the health department, and through the growth and expansion of local, state, and national programs.

II. Functions of School Physicians

A. *The Duties and Functions of the School Physician Include:*

1. *Periodic medical examination of children*—This is to demonstrate the value of health examinations, to give children the educational experience of learning how well they are, to evaluate growth and development, to reveal conditions which might adversely affect the health or educational progress of children, and to furnish recommendations for the care and alleviation of these conditions. Teachers and even parents are often unaware of abnormalities in the child and are frequently unfamiliar with the sources of, and necessity for, treatment. This function necessarily includes mass-testing procedures such as for vision and hearing.

2. *Professional consultation in health education*—Actually, the pupil's medical examination in the presence of the parents * can be made one of the most potent health education influences in the child's life. These examinations offer the school physician opportunities of presenting health information to pupils and parents, and to confer with teachers regarding individual findings, thus enabling him to influence their ideas on health. Correcting misconceptions, dispelling superstitions, and instilling a desire for accurate, scientific facts are fundamental contributions of physicians to health education.

 As a consultant in the preparation of health courses he can check the medical accuracy of study and source materials, suggest timely topics for inclusion, and advise on the selection of health facts important for pupils as distinguished from those of less importance. The *1942 Year Book* of the American Association of School Administrators states:

 "The functions of the modern school physician are educational. The school requires a medical inventory of the health status of its children, both for their general welfare and to indicate necessary variations in school procedures. The health examination, ideally made in the presence of the parents, serves to screen out children where conditions require diagnosis and those whose obvious ill health indicates a need for immediate attention. To the family physician and to available clinics or other approved medical agencies, belongs the responsibility of diagnosis and appropriate treatment. To the school physician and other members of the school staff belongs the responsibility of result-producing health guidance in cases where action is indicated."

3. *Responsibility for the prevention and control of communicable diseases in the school*—Procedures established by the school physician and health officer for preventing the spread of such diseases must be carefully explained to administrators, teachers, custodians, parents, and pupils. Smallpox re-vaccination, diphtheria re-

* Elementary school children are usually best examined in the presence of one or both parents. High school students are often seen individually, and a consultation with parents arranged at a later time.

immunization and such other specific preventive measures as are supplementary to the earlier protection given infants and preschool children and are approved by the local medical profession are systematically organized by the school physician, bearing in mind that these too are potent and beneficial educational experiences. The carrying out of measures in the school for the control of epidemics is often a responsibility delegated to him by the health officer. Guidance in the use of tuberculin testing and other methods of tuberculosis case finding are also the province of the school physician.

4. *School safety and safety education*—This is another part of the school physician's educational function. One of his first responsibilities is the establishment of well understood policies and procedures for the care of school emergencies. The smooth functioning of these procedures when a child is hurt is a valuable piece of safety education for all concerned. His advisory responsibility for the safety of school buildings and grounds, together with his professional knowledge of the results and underlying physical and emotional causes of accidents, make him an invaluable consultant in teaching safety.

5. *Directing teachers and school nurses in systematic and continuous observation of the health of pupils*—so that they may identify those who are normal and so that deviations from normal will be discovered early and investigated by experts. This may include programs for weighing and measuring, for testing vision and hearing, and for securing health histories.

6. *Selecting pupils for special educational programs*—such as lip reading instruction, speech correction, sight conservation, visiting teacher service, modified physical education, shortened school day, rest periods, advising with teachers in constructing educational programs for the physically handicapped. This includes guidance of physical education and corrective physical education teachers in providing modified and suitable exercises for those suffering from postural defects, nervous and crippling disorders and the like.

7. *General supervision of sanitation and other environmental health factors within the school buildings and grounds*—This includes the safety of water, safety of food and milk supplies in the lunchroom and their safe treatment by food handlers, the proper disposal of sewage and wastes, sanitation of drinking fountains and wash rooms, proper eating, lighting, heating and ventilation, safety of gymnasium and playground.

8. *Medical advice to school authorities on mental and emotional health influences*—such as the length of the school day, extracurricular activities, the frequency of recess periods, type of examinations, methods of marking, and technic of handling individual children.

9. *Professional guidance in the field of teacher's health*—The teacher's mental as well as her physical health is of direct concern to her employer because of its effect on the quality of her work. In this area the school physician is comparable to the medical director of an industry who is given broad responsibility for employees' health maintenance, while actual diagnosis and treatment are usually done by the employee's private physician, the school physician often conducts periodic health examinations and offers consultation to employees with health problems.

10. *Administrative functions*—such as the skilled supervision of personnel within his department, preparation of budgets and reports, the development of health and medical records, and the statistical analysis of records and results.

11. *Responsibility to the school system and the community for integrating the school health program into the public health program of the community* *—Health maintenance and protection are of equal importance to infants, children, adults, and aged. The school health program has too often been considered a separate entity, apart from the community health program as a whole. It is a coöperative enterprise both inside and outside the school. Outside the school it involves coöperative effort with health departments, voluntary health agencies, welfare agencies, clinics and hospitals, individual physicians, and organized medicine. Inside the school it involves coöperation between physicians, dentists, nurses, principals, psychologists, cafeteria directors, custodians, classroom teachers, supervisors, and superintendents. The school physician interprets his job to agencies and individuals outside the

* The school administrator is responsible for integrating the activities of the entire school system with the work of many agencies in the community. In his work with community health agencies the school physician is guided by the administrator's general policies and keeps him currently informed.

school. He elicits and fosters the assistance of departments and individuals within the school. He recognizes the interrelationships of all individuals and groups who can help attain the goal of healthier, happier people.

12. *Incidental functions and duties*—which are important but need not be detailed—include coöperation in the development of an effective physical education program on the basis of sound health standards including the health supervision and guidance of athletes; advice to those responsible for the school cafeteria to insure the sanitary safety of food and its nutritional adequacy; assistance with the in-service training of teachers in health subjects; continued search for and elimination of outmoded procedures and policies which impede the securing of medical care and other remedial work; assistance with the vocational guidance of the physically handicapped.

B. *Two Classifications of School Physicians*

There are variations in the responsibilities and duties of school physicians depending in part on the size of the schools served, the number of physicians employed, and the completeness of the school health program. In a large school system there may be many physicians working under the general supervision and direction of a chief physician. In still larger school systems the chief physician may have one or more deputies, some of whom may have special titles, descriptive of their specialized duties. In smaller communities one physician may be employed to serve several school systems. In many areas a part-time physician is used.

To differentiate between the qualifications needed by a physician who administers, or assists with the administration, of a school health program, devoting his full time thereto, and one who works under the supervision of another, two classifications of school physicians are designated for the purpose of this report. They will be referred to here as "Director, Deputy, or Assistant Director of School Health" and "School Medical Adviser." These titles are not necessarily recommended to school systems, but are used here to differentiate between the qualifications needed for the duties performed by two classes of medical personnel.

1. *Director, Deputy, or Assistant Director of School Health*—Regardless of whether this is his actual title, this type of school physician will ordinarily be a full-time employee of the board of education or the health department, with a rank of, or equivalent to, an assistant superintendent for those employed by schools or assistant health officer or deputy for those employed by health departments. He establishes policies, selects other medical personnel, is responsible to the school superintendent or health officer, or both, supervises, guides, and evaluates all medical phases of the school health program.

 Ideally, such a physician with the special qualifications set forth below should be obtained to administer and supervise the medical aspects of the school health program in all schools. This is almost an essential in large communities. In smaller communities a practical solution is for several schools in one or more counties or districts to join in the employment of such a person. In other small communities it is often practical to employ the health officer in this capacity especially if he has the basic qualifications set forth below and has the ability to administer the two positions. This has the advantage of assuring the integration emphasized above.

2. *School Medical Advisers*—Regardless of whether this is his actual title, this type of school physician will be a staff member working under the direction of a "Director of School Health." While good administration will require that the director consult his staff members regarding policies and procedures, "School Medical Advisers" will be concerned primarily with carrying out established procedures. They will ordinarily by part-time physicians. They will be recruited from competent physicians in the community, who wish to devote part of their time to public health, and whose qualifications meet those listed below.

 The selection of "School Medical Advisers" should rest with the "Director of School Health" or the health officer if he

is acting in that capacity, subject to such Civil Service or Merit System regulations as may exist. Selections of medical personnel usually calls for careful scrutiny of personal and professional qualifications which is best done by one who is himself well trained in medicine and public health.

III. BROAD EDUCATIONAL BACKGROUND OF SCHOOL PHYSICIANS

Both "Directors of School Health" and "School Medical Advisers" should above all be good doctors. They should have the M.D. degree from a Class A medical school, so designated by the Council on Medical Education and Hospitals of the American Medical Association, plus an interneship in a hospital approved by that Council.

IV. GRADUATE EDUCATION

Note: This section proposes desirable areas of competence for physicians engaged in school health work. The recommendations are made for the guidance of (1) officials responsible for the appointment of school physicians, (2) individuals looking forward to careers in school health work, (3) universities contemplating the offering of special courses in this field.

The professional competence of persons now performing creditable service as school physicians is recognized. It is realized that many have not had the opportunity to acquire the formal education or graduate degrees suggested herein. However, it is to be emphasized that an exception to the requirements for a postgraduate course and the other qualifications listed should be made only if the candidate in addition to years of experience has actually demonstrated unusual ability as a school physician.

A. "*School Medical Adviser*"

A beginning policy of limiting recommendations to those workers who are devoting themselves to a career in full-time public health work has been adopted. The "School Medical Adviser" is not ordinarily a full-time career worker. Recognizing his value to the school health program, however, and the dilemma sometimes confronting school superintendents when local physicians are recommended for school appointments by influential people, the following suggestions are submitted:

Preference should be given to physicians who have had special training and experience in the fields of pediatrics or internal medicine. Physicians who, in addition to a sound background of clinical experience in pediatrics or internal medicine, have had special training and experience in the field of public health, should receive additional consideration for appointment.

Special training in pediatrics may be judged by possession of one or more of the following qualifications, which are named in the order of their importance: (1) Certification as a pediatrician by the American Board of Pediatrics*; (2) Eligibility for certification by the American Board of Pediatrics, or qualifications meeting Board requirements; (3) Completion of one year as a Resident in Pediatrics in a hospital approved for such residency by the Council on Medical Education and Hospitals of the American Medical Association; (4) Completion of one year on the pediatrics staff of a hospital which has a Resident in Pediatrics and which has been approved for such residency by the Council on Medical Education and Hospitals, American Medical Association; (5) Completion of 18 months' interneship, including an appointment in pediatrics in a hospital approved by the Council on Medical Education and Hospitals, American Medical Association; (6) Specializing part-time in pediatrics with an appointment in pediatrics in a hospital approved by the Council on Medical Education and Hospitals, American Medical Association.

* The American Board of Pediatrics is an independent board of pediatricians established to provide a uniform standard of competency in the field of pediatrics. For information regarding these standards, address the Board at 707 Fullerton Avenue, Chicago, Ill.

In larger school systems it is assumed that "School Medical Advisers" will be working under the administrative and supervisory direction of a "Director of School Health." Their training and experience will be augmented by in-service training provided by the director through individual conferences, special studies, group projects, and other supervisory technics.

B. *Director, Deputy, or Assistant Director of School Health*

1 *Specific Knowledge, Skill and Experience*—The scope of modern school health activities requires that the "Director of School Health" be a career man with special training both in education and in public health. In addition to being a well trained physician with some of the qualifications listed above for the "School Medical Adviser" he will need the following special training and experience:

a. Basic principles of public health including general philosophy of mass health protection, epidemiology, vital statistics, record systems and record keeping, environmental sanitation, and the principles of public health administration.

b. Principles of growth and development of the child, the philosophy of modern education and its relationship to other community endeavors, an understanding of school procedures and organization, the principles of educational supervision and administration, educational psychology, the administration of school health programs, including development of health education curricula, the organization and conduct of special classes such as speech correction, lip reading, and sight saving, and the development of school mental hygiene programs including mental testing. Ideally, the "Director of School Health" should be qualified as a "School Medical Adviser" and should have had two or more years' experience in that capacity Those who do not have the suggested public health and educational background should obtain it as soon as possible after appointment. This should be stipulated at the time of appointment.

c. Upon completion of the "in residence" training listed above, the trainee should have an opportunity for observation and practice in well selected field training centers where outstanding work is being done. This may require a few weeks to three months depending on the amount of previous practical experience.

These are essentially the requirements for the Master of Public Health degree in most schools.

2. *Personal Qualities*—The need for coöperative effort with many diverse groups and individuals emphasizes the importance of personal qualities of leadership, such as understanding of others, ability to select and help develop subordinates, ability to evaluate and improve accepted procedures, a friendly but dignified manner, a liking for children, and for preventive medicine.

3. *Approximate Time Required for Special Training*—The physician interested in this field presents an educational status somewhat different from the undergraduate or the non-professional student. For this reason, it is believed that one calendar year of specialized, concentrated work, which would include his field work, is sufficient.

4. *Type of Institution Best Fitted for Such Training*—It is important, however, that this work be undertaken in a school where his individual needs are carefully assayed and courses offered to fulfil these needs, where his time is well planned, and where there are rich opportunities for professional association and discussion as well as practice and observation in the field. It is essential that there be close association between the school of public health and the school of education. Neither school alone can complete the training of a potential director of school health. The leading schools of public health in this country and Canada, which have close association with the school of education, particularly those meeting the "minimum facilities needed for graduate instruction in public health" [1] as listed by the Committee on Professional Education, American Public Health Association, are usually well suited to offer this type of training in the time suggested.

1. See "Memorandum Regarding Minimum Educational Facilities for the Postgraduate Education of Those Seeking Careers in Public Health," prepared by the Committee on Professional Education, American Public Health Association and published in the *American Journal of Public Health*, May, 1942.

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Restrictions on Use of Agar Removed

According to an announcement of the War Production Board, stockpiles of agar have now been improved to such an extent by newly developed domestic production and by imports from Mexico that restrictions on the use of agar have been removed. Beside uses in bacteriological cultures, for which the seaweed found on the West Coast is most suitable, agar is also used in the preparation of medicinals and food and in certain manufacturing processes. The WPB has announced that, to insure fulfillment of any emergency needs for agar, a stockpile is being reserved by the Defense Supplies Corporation.

Preliminary Report on a National Program for Medical Care*

AT the last annual meeting of the Committee on Administrative Practice of the American Public Health Association, the committee directed its Subcommittee on Medical Care to draft a set of principles setting forth the desirable content of a comprehensive program of medical care; the methods of its administration; and the part which public health agencies should take in its operation.

In pursuit of this assignment, the subcommittee has completed a tentative draft, which will be considered by the Committee on Administrative Practice at its next meeting, October 1, 1944.

The draft report of the Subcommittee on Medical Care is being published in the *American Journal of Public Health* at this time in order that the entire membership, as well as the Committee on Administrative Practice and the Governing Council of the Association, may have ample opportunity to study the proposals in advance of formal action.

To facilitate the expression of opinion on this preliminary report, the Chairman of the Subcommittee on Medical Care will be pleased to receive and tabulate the viewpoints of members of the Association.

Because of its composition and charge the subcommittee has limited its considerations to one sector of a comprehensive national health program; namely, medical care.

In preparing the preliminary report, the subcommittee has considered: (A) The objectives of a national program for medical care; (B) The needs for such a program; and (C) Recommendations for immediate action.

A. THE OBJECTIVES

I. A national program for medical care should make available to the entire population, regardless of the financial means of the individual, the family, or the community, all essential preventive, diagnostic, and curative services.

II. Such a program should insure that the services provided be of the highest standard, and that they be rendered under conditions satisfactory both to the public and to the professions.

III. Such a program should include the constant evaluation of practices and the extension of scientific knowledge.

B. THE NEEDS

I. A large portion of the population receives insufficient and inadequate medical care, chiefly because individuals are unable to pay the costs of services when they are needed, or because the services are not available.

II. There are extensive deficiencies in the physical facilities needed to provide reasonably adequate services. Such facilities include hospitals, health centers and laboratories. The needs are most acute in poor communities, in rural areas, and in urban areas where the population has increased rapidly or where the development of facilities has been haphazard or the financial support inadequate.

* Presented to the Committee on Administrative Practice by the Subcommittee on Medical Care as a Statement of Principles.

III. There are extensive deficiencies in the numbers and the distribution of personnel needed to provide the services. Here again, the needs vary according to types of personnel and to types of communities.

IV. There are extensive deficiencies in the number and types of personnel qualified to administer facilities and services.

V. Many communities still are not served by public health departments; others inadequately maintain such departments. Thus, some communities have never utilized organized health work to reduce the burden of illness; and others share its benefits only in part.

VI. Expansion of scientific research is urgently needed. Despite past and current scientific advances, knowledge as to the prevention, control, or cure of many diseases is lacking.

Each of the six conditions defined above can be broken down into many component parts representing specific needs. In general, however, solutions of these broad problems require simultaneous attack on four fronts: namely, the distribution of costs, construction of facilities, training of personnel, and expansion of knowledge.

C. RECOMMENDATIONS

The recommendations presented in this report represent guides to the formulation of a policy for action. It is believed that study of these recommendations by the professions and others concerned in the states and localities will produce new and more specific recommendations for the attainment of the objectives of a national health program.

Recommendation I. The Services

a. A national plan should aim to provide comprehensive services for all the people in all areas of the country. In light of present-day knowledge, the services should include hospital care, the services of physicians (general practitioners and specialists), supplementary laboratory and diagnostic services, nursing care, essential dental services, and prescribed medicines and appliances. These details of content must remain subject to alteration according to changes in knowledge, practices, and organization of services.

Because of inadequacies in personnel and facilities, this goal cannot be attained at once; but it should be attained within ten years. At the outset, as many of the services as possible should be provided for the nation as a whole, having regard for resources in personnel and facilities in local areas. The scope of service should then be extended as rapidly as possible, accelerated by provisions to insure the training of needed personnel, and the development of facilities and organization.

b. It is imperative that the plan include and emphasize the provision of preventive services for the whole population. Such services include maternity and child hygiene, school health services, control of communicable diseases, special provisions for tuberculosis, venereal diseases, and other preventable diseases, laboratory diagnosis, nutrition, health education, vital records, and other accepted functions of public health agencies, which are now provided for a part of the population.

Recommendation II. Financing the Services

a. Services should be adequately and securely financed through social insurance supplemented by general taxation, or by general taxation alone. Financing through social insurance alone would result in the exclusion of certain economic groups and might possibly exclude certain occupational segments of the population.

b. The services should be financed on a nation-wide basis preferably with

state participation; and under conditions that will permit the federal government to equalize the burdens of cost in accordance with ability to pay.

Recommendation III. Organization and Administration of Services

a. A single responsible agency is a fundamental requisite to effective administration at all levels—federal, state, and local. The public health agencies —federal, state and local—should carry major responsibilities in administering the health services of the future. Because of administrative experience, and accustomed responsibility for a public trust, they are uniquely fitted among public agencies to assume larger responsibilities and to discharge their duties to the public with integrity and skill. The existing public health agencies, as now constituted, may not be ready and may not be suitably constituted and organized, in all cases, to assume all of the administrative tasks implicit in an expanded national health service. Public health officials, however, should be planning to discharge these larger responsibilities, and should be training themselves and their staffs. This preparation should be undertaken now because, when the public comes to consider where administrative responsibilities shall be lodged, it will be influenced in large measure by the readiness for such duties displayed by public health officers and by the initiative they have taken in fitting themselves for the task.

b. The agency authorized to administer such a program should have the advice and counsel of a body representing the professions, other sources of services, and the recipients of services.

c. Private practitioners in each local administrative area should be paid according to the method they prefer, *i.e.*, fee-for-service, capitation, salary, or any combination of these. None of the methods is perfect; but attention is directed to the fact that fee-for-service has a history of unsatisfactory results.

d. The principle of free choice should be preserved to the population and the professions.

e. State departments of health and other health agencies are urged to initiate studies to determine the logical and practical administrative areas for a national medical care plan.

Recommendation IV. Physical Facilities

a. Preceding, or accompanying, the development of a plan to finance and administer services, a program should be developed for the construction of needed hospitals, health centers and related facilities, including modernization and expansion of existing structures. This program should be based on federal aid to the states and allow for participation by voluntary as well as public agencies. The desirability of combining hospital facilities with the housing of physicians' offices, clinics, and health departments should be stressed.

b. Federal aid to the states should be given on a variable matching basis in accordance with the economic status of each state.

c. Because of its record of experience and accomplishment in this field, the U. S. Public Health Service should administer the construction program at the federal level, in coöperation with the federal agencies responsible for health services and construction.

d. Funds available under this program should be granted only if:

(1) The state administrative agency has surveyed the needs of the state for hospitals, health centers and related facilities, and has drawn up a master plan for the development of the needed facilities (taking account of facilities in adjacent states); or, in the absence of a state plan, the project is consistent

with surveys of construction needs made by the U. S. Public Health Service;

(2) The proposed individual project is consistent with the master plan for the state; its architectural and engineering plans and specifications have been approved by the state agency and/or the U. S. Public Health Service; and there is reasonable assurance of support and maintenance of the project, in accordance with adequate standards.

e. State health departments are urged to conduct studies to develop state plans for the construction of needed hospitals, health centers and related facilities. Such studies should be made in coöperation with official health agencies, with state hospital associations, and other groups having special knowledge or interests.

Recommendation V. Coördination and Organization of Official Health Agencies

a. The activities of the multiple national, state, and local health agencies should be coördinated with the services provided by a national program. There is no functional or administrative justification for dividing human beings or illnesses into many categories to be dealt with by numerous independent administrations. It is difficult to reorganize agencies or to combine activities, and this cannot be accomplished hurriedly. Therefore, studies and conferences should be undertaken without delay in states and communities where the health structure is already unnecessarily complex.

b. The federal and state governments should provide increased grants for the extension of adequate public health organization to all areas in all states. Increased federal grants should be made conditional upon the requirement that public health services of at least a specified minimum content shall be available in all areas of the state.

Recommendation VI. Training and Distribution of Service Personnel

a. Within the resources of the program, financial provisions should be made to assist qualified professional and technical personnel in obtaining postgraduate education and training.

b. The plan should provide for the study of more effective use of auxilliary personnel (such as dental hygienists, nursing aides, and technicians), and should furnish financial assistance for their training and utilization.

c. Professional and financial stimuli should be devised to encourage physicians, dentists, nurses, and others to practise in rural areas. Plans to encourage the rational distribution of personnel, especially physicians, should be developed as quickly as possible, in view of the coming demobilization of the armed forces. Such plans should be integrated with the whole scheme of services and the establishment of more adequate physical facilities.

Recommendation VII. Education and Training of Administrative Personnel

a. Education and training of administrative personnel should be encouraged, financially and technically, especially for those who may serve as administrators of the medical care program, for hospital and health center administrators and for nursing supervisors.

b. State health departments should utilize training funds that are now available to train personnel in such technics as administration of health and medical services, and hospitals. Such a training program may contribute more than any other single activity to the future rôle of the official public health agency. As a corollary, the attention of schools of public health is directed to the importance of establishing the necessary training courses.

Recommendation VIII. Expansion of Research

a. Increased funds should be made available to the U. S. Public Health Service and to other agencies of government (federal, state, and local) for research and for grants-in-aid to non-profit institutions for the support of laboratory, clinical, and administrative studies and demonstrations.

b. The research agencies and those responsible for making grants-in-aid should be assisted by competent professional advisory bodies to insure the wise and efficient use of public funds.

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1943 Touches New Low in Infant Mortality

The U. S. Children's Bureau, Washington, announced in July that the lowest infant mortality rate on record, 39.9 infant deaths per 1,000 live births, had been recorded for 1943. According to the Children's Bureau, this drop in infant deaths was doubly remarkable because it was 12 per cent under the 1941 figure and it was accomplished during a war period. According to the Bureau, these declining death rates followed a 7 year trend, the infant mortality rate having been cut almost a third and the maternal death rate more than half from 1936 to 1942. It was pointed out that this marked decline had coincided with the extension of maternal and infant health services by the states, and made possible in part through the use of Social Security funds. In 1943 the low point in infant deaths also coincided with the implementing of the program under which the wives and babies of service men in the lower-paid grades received free medical care.

In analyzing the 1942 maternal death rate of 25.9 per 10,000 live births, the Children's Bureau pointed out that this figure showed variations among the states from 20 or less in a third of the states to more than 40 in Florida, Georgia, Mississippi, New Mexico, and South Carolina. The Bureau reported however, that remarkable gains have occurred in the southern states, even though the maternal death rate remains comparatively high in these areas.

Vol. 34

American Journal of Public Health
and THE NATION'S HEALTH

Official Monthly Publication of the American Public Health Association

Volume 34 | September, 1944 | Number 9

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PUBLIC HEALTH, PUBLIC MEDICAL CARE, AND PUBLIC WELFARE

THERE is a growing tendency for experts in public administration to raise searching questions in regard to the relation between health services and other state and local governmental agencies. "Should the care of the sick poor be transferred from the Department of Charities to the Department of Health?" "Should the Department of Health and the Department of Charities be combined?" "Should the Department of Health and the Department of Welfare be placed under a single administrative authority?" Problems of this sort have become vital issues within recent months—in California, in New England, and at points between.

The administrative reasoning which underlies these queries is obvious. It derives from the general principle that the relative burden of overhead decreases—within limits—with the size of an administrative unit. This principle is sound; but its applicability depends on two important factors—on the meaning of the word "overhead" in a given case, and on the significance of the phrase "within limits."

Certain kinds of overhead are common to many public departments. Accounting and purchasing, for example, involve almost universal problems and can be well handled by central accounting and purchasing services. The major tasks of defining policies, establishing standards of personnel, and supervising and stimulating work, on the other hand, differ widely. Even the most enthusiastic expert on organization charts would not expect to promote efficiency by combining the public library and the fire department. The first essential factor in judging of proposed plans of consolidation is to determine how close is the common bond between two bureaus or divisions whose union is contemplated. From this standpoint, the combination of health and welfare departments has no argument in its favor. It is true that both departments deal with human beings; but, aside from that fact, the spirit, the technics, and the personnel involved are radically diverse.

The health officer and the welfare officer have different trainings and different objectives. They work in widely different, and to some degree alien, psychological atmospheres. The task of the physician is to provide health guidance and health care, in proportion to the need for such care. The task of the social worker is to rehabilitate or to relieve the financial status of families suffering under economic handicaps. These two objectives may be correlated, but cannot wisely be intermingled. Only in the most improbable instances can a man who is competent to direct a health department be competent to direct a welfare department, and vice versa. Under these circumstances, a combination of health and welfare, while it may produce a neater looking organization chart, represents a net loss rather than a net gain in efficiency. Under such a plan, first rate directors of health and of welfare must still be retained; and the result is likely to be merely the addition above them of an additional highly paid political job. Where such a combination has actually been attempted its influence upon the public health service has been almost uniformly damaging.

The transfer of medical service for the indigent or of the management of public hospitals and clinics to the health department is a horse of another color. Here, there is a real community of interest. Here, the health officer has training and experience which fit him—better, at least, than any other public officer usually available—for the management and direction of the services involved.

Many health officers dread such responsibilities and many have refused to accept them—even under considerable local pressure. They feel that the heavy administrative and financial responsibilities involved will divert energies which they prefer to apply to the standard tasks of public health (as has actually happened in certain large American cities). One can sympathize with this very natural point of view and yet feel that it is often a short-sighted one. Where a community is operating a medical care program under the welfare department, or a hospital or tuberculosis sanatorium under a separate governing board, and where there is good reason to believe that these services would operate better under the health officer, the interest of the community must be the governing one. If that interest—in a given case—will be best served, individual preferences and old habits of thought must give way.

At this point, however, we must recall the other qualification of the principle which should govern all consolidations. Increased size of a unit tends to decrease overhead "within limits." Even if two administrative units are of essentially the same kind, there is a maximum size which is economically efficient. In a town of 30,000 population a good health officer can administer both a health department and a hospital, with resulting economy in overhead. In a city of several millions the health department requires every minute of the time of the best administrator who can possibly be obtained; and so does the hospital department. To combine health and hospitals in New York City or Los Angeles County would, again, merely involve an additional high-priced coördinator with no resulting gain. It would sacrifice real efficiency for the sake of an organization chart.

The guide in this matter of consolidation should be common sense, in the light of local conditions and local personalities. "There is no universal truth except that no truth is universal." Good administration must be built round human beings. In general, however, it will be found that consolidation brings good results when—and only when—the things consolidated are of essentially the same kind—and when each of the units consolidated is not quantitatively so large as to demand the full attention of the best executive probably available.

THE BRITISH WHITE PAPER

SOME two years ago, the Beveridge report (which dealt in the main with economic and administrative details of the general social security program) recommended the establishment of a comprehensive national health program for all the people, including all types of medical service. This was one of its proposals which received almost instant approval and was accepted, in principle, by the government in February, 1943. After preliminary conferences with the medical profession, the local hospitals, and local government authorities, a summary of proposals for such a comprehensive national health service has now been prepared and published.[1] It is to be fully discussed in Parliament and elsewhere prior to the introduction of formal legislative proposals.

The National Health Insurance Act[2] was passed in 1911 and provided general practitioner care for a considerable section of the population. This plan proved so successful that—as early as 1920—a Consultative Council on Medical and Allied Services appointed by the Minister of Health, with Lord Dawson of Penn as chairman, recommended the extension of the program to include all forms of medical service and to reach a larger section of the population. This is the ideal now, at last, specifically outlined in the White paper.

The plan aims at "building on foundations laid by much hard work over many years and making better what is already good." It involves no compulsion on either medical practitioners or the public but proposes to make available to all people, irrespective of income, not only general practitioner service but consultant, clinic, and hospital services of all kinds. Both individual practice and group practice are contemplated but group practice in local health centers is placed in the forefront of the plan; and it is hoped that these health centers will follow the general lines laid down by the Peckham Center in London.[3] It is expected that both voluntary hospitals and local public hospitals will coöperate in the program; and midwifery, home nursing, and health visiting (our public health nursing) will be included.

The cost of the plan—estimated at 148,000,000 pounds a year—" will be borne partly from central funds, partly from local rates, and partly from the contributions of the public under any scheme of social insurance which may be brought into operation." The program will be operated by local authorities, under the general direction of the Ministry of Health. Both centrally and locally, there will be provision for advisory boards, representing both the pubic and the professional interests concerned.

The atmosphere of constructive coöperation in which this revolutionary change is being prepared is more significant for us in the United States than the actual program itself. The British Medical Association, at its meeting last fall, advocated the extension of the present National Health Insurance system to include the dependents of insured persons and to cover specialist, laboratory and hospital services; and urged that medical care should be provided by group practice in medical centers. Payment on a fee-for-service or capitation basis, rather than on full-time salary, was favored. The *Lancet* (Sept. 4, 1943) said (in objecting to half-measures), " the public, we believe, will demand that the same medical advantages shall be available to every member of the community, and this is the first requisite for securing the highest quality of service."

On February 18, the day after the White Paper was released, the British

Medical Association issued a statement [4] indicating its approval of the general philosophy of the plan and bringing forward a number of specific points on which further detail is required and some on which possibly desirable changes are suggested. The statement concludes with these words: "To sum up, the White Paper provides a framework within which we believe it to be possible to evolve a good comprehensive medical service though its worth to the public and its acceptability to the profession will depend on the clarification and on negotiation on many important points. If the principles with which it opens are the principles which permeate the changes to come, we are hopeful that the profession's full coöperation will be achieved. Our immediate reaction is one of cautious welcome."

In addressing the Royal College of Physicians on March 2, Prime Minister Churchill said, on his side: "It is not a rigid or arbitrary plan. We welcome constructive criticism. We claim the loyal and active aid of the whole medical profession." The program will be submitted for full consideration by all British physicians before action.

There is a similar constructive atmosphere in the discussion of the plan for health insurance now under consideration by the Dominion of Canada.[5] The Canadian Medical Association has approved the principle of health insurance and has made concrete and helpful suggestions for modification of the measure now under debate.

The problem of the health of the people is too important to be made the football of politics—either governmental or medical. It can only be solved wisely by full coöperation between the public and the professions involved. Why can we not discuss this matter sanely and coöperatively in the United States?

Senator Wagner and his associates in Congress who are studying this problem have repeatedly indicated their eagerness for constructive advice. They have received such advice from the Committee of Physicians for the Improvement of Medical Care and from the Physicians' Forum (which has now spread from New York City to include branches in many other cities). In the main, however, they have been faced only by high-pressure propaganda. Catchwords of "political medicine," "one-man medical care," "Bureaucracy," "doctors—to care for the loved ones—who are first political stooges and henchmen instead of self-respecting human beings"—cannot provide the answer of a great profession dedicated to human service when it is called on for coöperation in working out a program for bringing its benefits to the people at present unable to receive them under self-respecting terms.

The major problem of the next few years is whether the organized medical profession of the United States can find voices more worthy of its vocation than those which now fill the air and inundate the drug stores. In helping to find such voices, the health officer—who is a physician dedicated in special degree to the public interest—can perhaps play a major rôle.

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2. The history of this subject is admirably summarized in the *Social Security Bulletin* for March, 1944, Vol. 7, No. 3, pp. 12–18, published by the Federal Security Agency of the Social Security Board, Washington, D. C.

3. Pearse, Innes H., and Crocker, Lucy H. *The Peckham Experiment. A Study in the Living Structure of Society.* George Allen & Unwin (London), 1943 (12s 6d).

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5. See *Canad. Pub. Health J.* for March, 1944 (35, 3:99–108) for statements by the President of the Canadian Medical Association and the Deputy Minister of Health of Manitoba.

BROTHERS-IN-ARMS

WE alluded last month to some of the wider problems involved in building the post-war world.[1] In solving these problems, the experience of the League of Nations will prove of inestimable value. The Health Section of the League (with which we, as health workers, are specially familiar), the International Labor Office, and other technical organizations of the League functioned with a high degree of efficiency; and they are certain, either to be continued, or to be duplicated under another name, in the world order of the future.

One major defect of the League, however, was over-centralization. It has been held by many students of its operation that the evolution of regional organizations within a broader international framework should be an essential factor in our plans for the future.

In this area of experimentation in international planning we, in the Americas, have an excellent model in the Pan American Sanitary Bureau. For the past two years, most of the American republics have been bound together in alliance against our foes in Germany and Japan. Since 1902, however, we have been associated in a continuing program of defense against the common enemies of mankind, the causes of preventable disease and death. The marble building of the Pan American Sanitary Bureau in Washington is an impressive symbol of a united purpose.

The cause of coöperation in the war against disease in the Americas has received powerful stimulation during the past two years through the activities of the Inter-American Cooperative Health Services of the Office of the Coordinator of Inter-American Affairs. Major General Dunham[2] has described some of the accomplishments of this organization, in close coöperation with the Pan American Sanitary Bureau and other United States agencies, and with the health authorities of 18 countries south of the Rio Grande.

It is an inspiring story; of health centers in El Salvador, of the sanitation of rubber plantations and railway construction in Brazil, of nutrition in Colombia, of malaria control in Honduras. It involves the training at our schools of public health of hundreds of young men who will go back to their countries and bring forth fruit an hundredfold. It includes emphasis on such fields as public health nursing, social service, and popular health instruction, in which we, in the United States, have been able to play a special pioneering rôle.

The really significant thing about this problem, however, is its truly coöperative nature. Of the men and women actually at work on projects sponsored by the Coördinator, on January first, 200 were from the United States, and 13,000 from the nations in which the work was carried on. More and more, in the future, the plan will operate as a two-way process. The heads of the schools of public health in Mexico and in South America who visited the United States last fall revealed to us a wealth of opportunity for students from the United States. We shall want to study malaria control in Brazil and social security in Chile and epidemiology in Peru. The tradition of Gorgas and Reed and Theobald Smith—of Carrion and Chagas and Oswaldo Cruz and Carlos Finlay—is a common tradition for us all. We shall more and more fully coöperate, as brothers-in-arms against all those evils, in the physical environment and in the social environment of man, which menace the health of the American peoples.

REFERENCES

1. The New World Order, Editorial, *A J P.H.*, 34, 8:872 (Aug.), 1944.
2. Dunham, George C. The Coöperative Health Program of the American Republics. *A.J.P.H.*, 34, 8:817 (Aug.), 1944.

BOOKS AND REPORTS

All reviews are prepared on invitation. Unsolicited reviews cannot be accepted.

The March of Medicine: *Number VIII of the New York Academy of Medicine Lectures to the Laity. New York: Columbia University Press,* 1943. 158 pp. Price, $2.00.

There has never been a time when the work of the physician was of greater interest—or of greater importance—than it is today. Under the impetus of war, medical research has been greatly accelerated and new discoveries and theories are almost daily in the news. Unfortunately, however, developments in the medical field have been so numerous and rapid that the average layman is at a loss to keep up with them or to appreciate fully their implications. Now, as never before, the average man in the street wants to know what our doctors are doing, what they are thinking, what plans they are offering for a healthier, saner post-war world. In its 1943 *Lectures to the Laity,* published under the title "The March of Medicine," the New York Academy of Medicine has taken an important step toward meeting this need. Here are six provocative discussions by eminent leaders in the field of medicine and psychiatry discussions of such widely varying and important topics as the rehabilitation of our criminals, the effect of war on medicine (and vice-versa), the basic requirement for post-war peace, and a new approach to the problem of teaching. Each of the lecturers brings to his or her subject the experience of years of studying and working with human beings, plus the discipline natural to scientific workers. As a result, their thoughts are, for the most part, intensely practical and down-to-earth.

Dr. Bernard Glueck's discussion of "Crime and Punishment" offers an unusually clear presentation of the new trends in the rehabilitation of our law-breakers, and of the great need for making the punishment *fit the criminal.* In the lecture entitled "The Scientific Method and Our Plans for Peace," Sir Norman Angell makes a brilliant plea for collective security as the only possible basis for avoiding aggression in the post-war world. Another specially interesting contribution is that of Dr. Franz Alexander, which analyzes and refutes the age-old argument that wars are the inevitable outcome of man's innate aggressiveness. Into his lecture on war and medicine, Dr. Edgar Erskine Hume packs a great deal of historical information on the importance of war to the progress of medicine as well as on the rôle of disease in the campaigns of the past. The remaining two topics dealing respectively with the implications of a child's concurrent physical and intellectual development and the ways in which natural law affects man's progress also provide much food for thought.

If there is any one criticism which might be leveled at the Academy of Medicine's *Lectures to the Laity* for 1943, it is that they are not sufficiently colloquial. Several of the discussions abound in such terms "palmar aponeurosis," "subcutaneous tenotomy," "dialysis," and "pyrophosphoric esters" a vocabulary which actually helps defeat the purpose of the volume by making difficult, if not baffling, reading for the layman. Despite this sometimes frightening terminology, however, *The March of Medicine* still

makes stimulating reading and is setting a valuable precedent in bringing to the public the challenging thoughts and opinions of some of our medical leaders.

SAVEL ZIMAND

Encyclopedia of Child Guidance—*Edited by Ralph B. Winn. New York: The Philosophical Library,* 1943. 456 pp. Price, $7.50.

This book contains summaries of knowledge about diverse material in the field of child guidance, especially that related to normal and pathological behavior of infants and children, psychological mechanisms, psychological testing, education, physical and emotional development, relationships between individuals, and physical defects. As the editor points out in the preface, the book has omissions in topic and material; to this reviewer the omissions are so many and so great that the book is not a standard reference book and its value as an encyclopedia of child guidance is therefore greatly lessened.

Most of the items are presented simply and clearly so that they may be easily understood and applied by workers in fields other than child guidance, and the discussions are frequently followed by good bibliographies and include those of antithetical thought. On the other hand, there is an unfortunate lack of bibliography for certain items; for example, the consideration of "castration complex" does not carry with it any bibliographical reference.

It is unfortunate that among the fifty or more contributors there is a predominance of educators and psychologists and that the profession of medicine, especially psychiatry, is inadequately represented. Familiar names of physicians doing basic work in the field of child guidance are lacking, and although psychoanalytic material is included in the summaries, there is a deficiency among the list of contributors of outstanding psychoanalysts.

In format the book at first glance appears attractive and weighty but on closer examination one is surprised at its poor construction. This may, however, be a wartime defect. All in all the cost seems excessive.

MILTON J. E. SENN

Cancer Teaching Day—*Division of Cancer Control, New York State Department of Health, Albany, N. Y., Vol. III,* 1943. 66 pp.

All persons interested in the medical aspects of cancer control will find value in this publication of the New York State Department of Health summarizing the medical clinics in Binghamton, Rochester, and Utica. The volume includes brief addresses by six qualified practitioners on The Management of the Patient with Incurable Cancer; What May Be Logically Expected from Pre and Post Operative Radiation in Mammary Cancer; The Diagnosis and Treatment of Cancer of the Prostate; The Role of the General Practitioner in the Cure of Cancer; The Significance of Enlarged Lymph Nodes; and The Importance of Pathologists in the Cancer Program.

This volume is the third in a series representing addresses before groups of the county and district medical societies of New York State in coöperation with the University of Rochester School of Medicine and Dentistry, the Medical Society of the State of New York and the Division of Cancer Control of the New York State Department of Health.

REGINALD M. ATWATER

Rorschach's Test, I. Basic Processes—*By Samuel J. Beck, Ph.D. New York: Grune & Stratton,* 1944. 223 pp. Price, $3.50.

Although this book is intended primarily for the use of those persons who either are aspiring to become or have already become experts in the Rorschach method, it will have a cer-

tain amount of interest for persons who have come into contact with the test as a result of its increased utilization by those who are professionally concerned with normal and abnormal personality. In essence the book is a manual of rules for classifying the responses to the Rorschach ink blot figures in accordance with Rorschach's terminology. It does not go beyond this basic step into the interpretation of these responses—a task which will be undertaken in a forthcoming volume. Each chapter deals with a separate aspect of the scoring process and the various underlying principles are clarified by the presentation of thousands of responses which have been classified by the author. The realization of the contention of the large group of Rorschach specialists that the technic is essentially an objective, scientific method will certainly depend upon the general adoption of some explicit system of scoring such as this book describes.

LILLIAN DICK LONG

Atlas of the Mouth—*By Maury Massler, D.D.S., M.S., and Isaac Schour, D.D.S., Ph.D., D.Sc. Chicago: American Dental Association,* 1944. 104 pp. Price, $2.50.

Here is substantiation of the saying "One picture is worth a thousand words." With unusually graphic illustrations and a minimum of textual explanations, the authors and their assisting artist present a concise review of oral anatomy and pathology that is so excellent that it is difficult to temper one's enthusiastic endorsement of it.

Dentists and physicians will find it an extremely valuable reference work through which both the possibly forgotten facts of oral anatomy and the more recent knowledge of oral pathology or abnormalities may be quickly reviewed. The text, technical, of course, in its terminology, is marvelously concise. Indeed one is inclined to feel that, in some instances, the authors have adhered too strictly to their obvious intention to limit their written words. However, even this criticism is scarcely valid since, according to the authors, the book is intended primarily to cover subjects "of common interest to both the dentist and physician" and to "stimulate the reader to seek further information." As the authors also point out, the comprehensive scope of the *Atlas* makes inadvisable an exhaustive treatment of any one of the numerous subjects depicted and briefly discussed. The omission of a topical index, whether for the sake of brevity or not, is regrettable.

Together with the authors, the Council on Dental Health and the Bureau of Public Relations of the American Dental Association are to be complimented for their respective parts in presenting an extremely worth while book to the health professions.

RICHARD C. LEONARD

Costs of Dental Care for Adults, Under Specific Clinical Conditions—*By Dorothy Fahs Beck, assisted by Mary Frost Jessup. (2nd ed.) Sponsored by the American College of Dentists. Lancaster, Pa.: Lancaster Press,* 1943. 306 pp. Price, $1.50.

This report is a continuation of a series of studies on the economic and social aspects of dental practice, the first of which was published in 1929. The author contributed one of these, "The Cost of Equipping a Dental Office," in 1932. All were prepared and published under the auspices of the American College of Dentists. The latest report was referred for comment and criticism to more than forty members of the College before it was published. It should reflect the opinions of this organization.

This particular study is limited to the "twin questions of time and cost" in rendering adequate dental service to a

low income group of patients; i.e., the *time* required to provide initial rehabilitation service and maintenance service thereafter and the *cost* of such services over a period of years.

The records of several clinics were used to secure necessary data, the principal one being the Dental Health Service Clinic in New York City, which had been operating as a pay clinic for a low income group for twelve years. The analysis of the records of this clinic was thorough and exhaustive. The Board of Directors of this clinic is made up of well known dentists in that community, who cooperated fully in the investigation. The investigators, however, admit that the clientele of this clinic "is not strictly representative of the low income group" and that the records of only 485 of the 21,281 patients treated at the clinic during the twelve years of its existence qualified for the sample. This represents 2.2 per cent of all registered patients.

The authors assume that these data will be of value to the dental profession, charitable institutions, and departments of public health. The profession, as a rule, seeks its clientele from the higher rather than the low income groups and is not particularly interested; the charitable institutions include dental care as one of their benevolent functions; the report is of value to them. Departments of health are primarily concerned with the prevention of disease rather than its cure, except where the latter is imposed upon them by law, regulation, or other official authority. It is doubtful whether they will find much of value in the report.

Without question, the largest expenditures of public funds for dental care and dental health education are applied through public schools and departments of health toward the prevention or control of dental disease in children, which is an indication of public interest in dentistry. This objective will never be attained by filling teeth and replacing those that are lost.

GUY S. MILLBERRY

The Art and Science of Nutrition —*By Estelle E. Hawley, Ph.D., and Grace Carden, B.S. (2nd ed.) St. Louis: Mosby,* 1944. 668 pp. Price, $3.75.

In revising their valuable book to produce this second edition the authors have managed to avoid expanding the volume more than about fifty pages. There are the usual numerous illustrations characteristic of the original volume; of the total of 139, 11 are in colors. Additional topics found to have received some discussion are food fads and geriatrics.

Any book that aims to cover as much ground as this one must necessarily limit sharply its discussion of individual topics. As illustrations of what this means here consider that the entire description of all the vitamins is accomplished in 36 pages; magnesium is covered in ten lines and manganese in 5 lines; and no mention made anywhere (so far as this reviewer could find) of balance studies with these mineral nutrients made on human beings. Perhaps this is not serious for the circle of readers for whom the book is intended, namely people who would not understand very much of the scientific details if they were given.

This reviewer believes that the authors might well have clarified the meaning of the term "gamma" (pp. 140–141), which is merely a Greek letter used by some workers and publishers as the symbol of the microgram, a unit of weight with which many vitamins are measured. It seems unfortunate that the official spelling of the name for vitamin B_1, namely *thiamine*, has not been used, especially since the spelling with a final *e* has been made

official by the United States Pharmacopoeia, the Federal Food and Drug Administration, two Councils of the American Medical Association, and other organizations of specialists that might be mentioned. On page 195 appears a short discussion of food laws, and the only federal law referred to is the one passed in 1906 in response to the agitation by Dr. Wiley. It was certainly an oversight to fail to mention the Federal Food, Drug and Cosmetic Act passed on June 25, 1938.

Mention of these minor imperfections should not, however, blind us to the real merits of this book. It contains a wealth of information, is full of useful tables and practical suggestions for meeting important dietary problems, is readable, full of pictures, and in every way a most valuable volume for the average reader. The reader who has had some training in nutrition will doubtless desire more detail than this book furnishes, but even he should find the illustrations and tables useful.

GEORGE R. COWGILL

Births, Infant Mortality, Maternal Mortality—*Graphic presentation, 1940. Washington: U. S. Department of Labor, Children's Bureau,* 1943. 34 pp. Price, $1.00.

This pamphlet, containing 34 tables and the same number of full page charts, presents the more pertinent facts on births and on infant and maternal mortality in the entire country and in individual states, with subdivision according to color. Because of differences in the definition and criteria of a stillbirth employed in the several states, a discussion of this subject is limited to an illustrated tabulation of these differences.

The charts are well arranged and clearly drawn. The graph on page 13B, depicting infant mortality in the expanding Birth Registration Area in 1915–1940, would gain by the addition of rates between one day and one month. The comparison made between the mortality under one day and the total mortality under one month obscures the very important fact that in the twenty-five year interval the rate between one day and one month was cut in half, while that under one day remained practically unchanged.

Since the foreword devotes about one-third of a page to a discussion of the semilogarithmic scale, the pamphlet, clearly, is not intended for professional vital statisticians. It is therefore regrettable that the reader is not told about the effect of underregistration, especially of births, upon the comparability of the rates. For instance, the table on page 11A tells us that in 1940 the State of Oregon had the lowest infant mortality rate, 32.9, while Arkansas was twenty-fifth with a rate of 45.7. However, according to a study made by the Bureau of the Census in 1940, only 76 per cent of the births were registered in Arkansas as compared with 97 per cent in Oregon. Arkansas could reduce its recorded infant mortality rate to 35.7, rising to the fifth place now occupied by Nebraska and Washington, through the mechanical expedient of lifting its birth registration to the Oregon level.

J. V. DEPORTE

Your Eyes—*By Sidney A. Fox, M.D. New York: Knopf,* 1944. 191 pp. Price, $2.75.

In this very timely book, the author, in a note to the reader tells better than anyone else could his reasons for writing it. "The average man," he says, "knows so little about his eyes! . . . offhand I can think of nothing of as great immediate importance to man about which he knows less. . . . Much of the little that the average man knows about his eyes is hearsay. Often it is misinformation gleaned from sources more interested in selling a product

than in disseminating accurate facts. The patient is entitled to more than this . . . judging from questions constantly asked in office and clinic. I have attempted to answer some of these questions."

In fulfillment, Dr. Fox has translated the terms used by the ophthalmologist into everyday language for the layman who is sufficiently interested to want to know what his eye difficulty is (if he has one), its cause, what can be done about it and, in particular, how it might have been prevented. It is evident that from his experience as an instructor of ophthalmology in the School of Medicine of New York University (Dr. Fox is now a major in the Medical Corps of the Army of the United States) he realizes that to be of value material must be presented in a form that can be assimilated by the learner. He presupposes that readers who are sufficiently intelligent to ask pertinent questions are entitled to answers that will not only give them the needed information, but increase their desire to know more and so gain their coöperation.

For those interested in the historical development, the first chapter, "The Light of the Body," will prove an excellent introduction to the material that follows. The chapter on "How We See" will clarify many misconceptions. Considerable space is devoted to the eyes of the young, those of the adult, and those of advanced years. In all cases emphasis is laid on early and adequate attention to any deviations from the normal. This is especially noted in the chapter on eye muscles. The author states that a cross-eye in an older child or adult is usually the "hallmark of neglectful careless parents." "Nowhere," he says, "is the biblical phrase about the sins of the parents visited on the offspring more applicable . . . the sins of omission." Dr. Fox warns of the necessity for caring for those latent muscle difficulties called phorias that "lie in wait ready to pounce and destroy our comfort."

Evidently some of his patients have been rebellious to the idea of wearing glasses. As an antidote he suggests it might be well that they ask themselves the question, "Would you rather that eyeglasses had not been invented?"

Color vision, so important a factor in wartime, is discussed, and the part that illumination plays in the intricate process of seeing is presented. A chapter devoted to eyes in traffic brings home the responsibility of both drivers and pedestrians if accidents are to be prevented.

Dr. Fox warns that quacks and high-powered salesmen, capitalizing on the fear of the populace, recommend panaceas for every ill that are all too often accepted by the credulous. He gives many practical helps and suggestions in his chapter on hygiene and first aid, emphasizing however, that sound advice is necessary before starting "on the uncharted sea of self-medication." He dwells on the necessity for immediate attention by qualified persons to eye injuries.

A few illustrations and line drawings help to clarify some of the more difficult points. A comprehensive index facilitates the ready finding of information on particular phases of the subject.

That noted ophthalmologist, Dr. Webb William Weeks, a former teacher of Dr. Fox, to whose memory the book is dedicated, would indeed, as the author states, "have smiled quietly and approved."

WINIFRED HATHAWAY

Course of Study in Health. Grades One to Eight—*Prepared by the Boston Health Department and the Schools of the Archdiocese of Boston. Boston, Mass.*, 1943. 172 pp.

This bulletin is a unique contribu-

tion in the field of school health education. Its significance lies not so much in its detailed content, as useful and practical as the content is, but in the manner in which the bulletin was developed. Working under the direction of a Central Advisory Committee, made up of representatives from the Boston Health Department and the Archdiocese of Boston, health educators of the department and experienced teachers in the parochial schools collaborated in the preparation of this material.

The stated purpose of the program as outlined in the bulletin is " to motivate and coördinate the activities of all who are engaged in caring for the health of children in the Parochial Schools of the City of Boston. . . . It not only seeks to keep children healthy, but it also emphasizes the educational values that must be an important feature of a sound and progressive school health program."

An Introduction outlines health education objectives and defines terms commonly used in school health. This is followed by a section on Health Education through Health Services, Physical Education and Healthful School Living and one on Health Education through Routine Procedures. In both sections policies and procedures applicable to this particular school system are well defined. The bulk of the bulletin is devoted to specific and detailed outlines for teaching health by direct instruction. Curriculum content and units are suggested for each grade, with an attempt at progression to make possible new material and new perspective from year to year. A health habit check list is provided in order that each teacher may determine the specific health problems of her school, and direct the health teaching for the year along channels that will be practical and suited to pupil needs.

The units contain a rich source of teaching suggestions and pupil activities. Each unit includes suggestions for correlations with other subjects as well as sample test questions. At the end of the bulletin one finds an extensive list of sources of health education material which should be of great help to the busy teacher.

A course of study is most useful when it stems from experiences of teachers and pupils themselves, and when it embodies the philosophy of the system for which it is intended. This course of study does both, and serves as a splendid example of an approach in curriculum building which could be followed by other school and health groups. RUTH E. GROUT

The Compleat Pediatrician—*By W. C. Davison. (4th ed.) Durham, N. C.: Duke University Press*, 1943. 270 pp. Price, $3.75.

The appearance of a fourth edition of this unusual work testifies to substantial popular appeal. The new edition appears to be considerably larger than the third and contains much new material. The arrangement, numbering of the articles, and extensive cross referencing are unchanged, and the author still discusses " the 329 diseases to which children are heir."

In order to make the book practical " it is as brief and concise as possible, and pathological and physiological explanations . . . are omitted." This inevitably tends to dogmatism and has resulted in some rather amusing sentences. One quotation will be of particular interest to public health workers. Under the general heading " Growth, Development and Child Care " appears the following:

" Sex: The ratio of males to females at birth is 1,043 to 1,000, and is higher in rural areas, immediately after wars and in Greece."

Inclusion of extensive factual material, details of laboratory tests, pre-

scriptions and much tabular matter undoubtedly makes the book very useful to pediatricians like the author, who says that rarely a day passes without his having to consult the book. But the author's training and background give him a critical ability which the average reader does not possess. There would seem to be a real danger that an uncritical reader might be misled by the many sweepingly dogmatic statements which the book contains.

Among the favorable items may be noted a very considerable emphasis on prevention, including health supervision and child guidance, typified by the statement in the introduction—"More children are saved by preventing disease than by treatment."

MYRON E. WEGMAN

The Illinois Commission for Handicapped Children—*Its Organiganization and Function.* 1943. 3 pp.

Children with Cerebral Palsy, 1943. 31 pp.

The Epileptic Child in Illinois, 1943. 40 pp.

Children with Speech Defects, 1943. 24 pp.

The Educable Mentally Handicapped Child in Illinois, 1943. 46 pp.

The Illinois Commission for Handicapped Children, Chicago, has released the above pamphlets which should be successful in stimulating local and general interest in the needs of children with certain specific restrictions.

The first pamphlet briefly describes the organization, duties, and responsibilities of the Commission as the official state agency created in 1941.

Children with Cerebral Palsy concisely describes the problem, enumerates present provisions in Illinois for care and education, and makes specific recommendations for a state-wide program. Of interest is the proposal to establish a demonstration center which, in addition to providing necessary care for children with cerebral palsy, would provide opportunity to study technics to assist such children and would provide training facilities for specialized personnel.

The general apathy concerning persons suffering from convulsive seizures, whose condition is not so serious as to require custodial care, is brought out in *The Epileptic Child in Illinois.* Again, the problem is adroitly presented. Facilities and unmet needs in the state are described. A state program for children with convulsive seizures is proposed and specific recommendations are made. In the opinion of the Commission, a program involves three major phases: (1) treatment, (2) public education, (3) research. Insufficient emphasis is placed in the pamphlet on the importance of necessary study by currently accepted methods by qualified personnel to assure an accurate diagnosis and indicated therapy.

Children with Speech Defects follows the general pattern of the two preceding ones. Included are the suggestions that the state teachers' training colleges be the centers for speech clinics and that a basic speech course be part of the training specified for state certification.

The Educable Mentally Handicapped Child in Illinois concisely presents recommendations to improve services and facilities for these children with emphasis on centralized administration and on extensive and coördinated plans for vocational education, guidance, training, and placement with follow-up care and supervision.

These pamphlets should be of interest to all individuals concerned in public health activities.

GEORGE S. FRAUENBERGER

A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

RAYMOND S. PATTERSON, PH.D.

Something to Crow About—As this fine report appears in a publication which you may not see, an abstract of it is attempted here—contrary to custom. Cancer patients are seeking medical care with only an average delay of 3 months after noticing the first sign: this is earlier than ever before in Massachusetts's history. As a measure of the effectiveness of early care, the records show that 80 per cent of patients with skin cancer and nearly 40 per cent of other cancer patients who were treated during the first month are alive 10 years later. This is twice the survival rate when care is delayed more than 1 month. Ten per cent of the state's cancer patients were cared for in public clinics and a significant improvement is noted in the proportion of the patients who are seen early. The cancer death rate has declined steadily during the past 9 years. Local cancer committees have carried on effective life saving educational campaigns.

ANON. Cancer Toll in Massachusetts Cut by Education. Bulletin (Massachusetts Dept. of P. H.). 9, 3:42 (June), 1944.

About Help That You May Someday Need—Eight objectives in health education as currently undertaken by the U. S. Public Health Service are outlined in this useful paper read before the last meeting of the A.P.H.A.

P. S. Dr. Studebaker's paper about School Health Education programs, which accompanies Dr. Coffey's statement, also should not be missed.

COFFEY, E. R. Planning for Health Education in the War and Post-War Periods—the National Program. Pub. Health Rep. 59, 28:897 (July 14), 1944.

Administration by Experts—By long odds, the paper-of-the-month is this brilliant essay. If you will insert the word "health" between the words "public administration" wherever they appear, then the President of Princeton will be talking directly to you. Here is only one of the many quotable gems in it: "No profession is competent to decide the problems arising from its relation to other groups and society." Hurry to the nearest library for this issue. Better still, subscribe to the Quarterly; it is by far the most provocative journal in our field.

DODDS, H. W. The Rôle of the Expert in Government: His Use and Abuse. Milbank Quart. 22, 3:207 (July), 1944.

When Appetites Were Gargantuan—Excellent source material for your possible comment on eating habits in "the good old days" is this combing of the literature of an earlier time.

FLYNN, M. A. Dining with Samuel Pepys in Seventeenth Century England. J. Am. Dietet. A. 20, 7:434 (July-Aug.), 1944.

In Sweden, Too—Swedish antivenereal disease laws, long held up to the world as models of enlightened control measures, did in fact produce gratifying results during the 20's and 30's. In 1940, the gonorrhea rate, thanks to improved diagnostic and therapeutic methods, dropped to its lowest reported figure. But wartime conditions have changed this happy state and both syphilis and gonorrhea have soared to new heights. How the Royal Medical Board proposes to meet the new conditions will interest American V.-D. officers.

HALLGREN, R. J. M. Legislative Measures

against the Spread of Venereal Diseases in Sweden. Pub. Health. 57, 9:96 (June), 1944.

Of Interest to Maternal Hygienists—Threatened abortion occurs in 1 out of every 8 pregnancies and three-fifths of the women so threatened will abort if the condition goes untreated. Spontaneous abortion occurs in 1 of every ten pregnancies. The modern, hormone-vitamin treatment of threatened abortion is discussed. It will do you no harm to know about this paper even if your particular job is plumbing inspection.

HERTIG, A. T., and LIVINGSTONE, R. G. Spontaneous, Threatened and Habitual Abortion: Their Pathogenesis and Treatment. New Eng. J. Med. 230, 26:797 (June 29), 1944.

Underscoring the Health in Public Health Nursing—It seems this fellow went out on the street and asked a lot of people what they thought about the public health nurse. What he learned induced him to ask the nurses if they were doing all they should to sell themselves to the public. There is no good reason why this wholesome paper should be read only by nurses. "It tolls for thee," too.

HUGHES, H. H. The Nurse in Public Relations. Pub. Health Nurs. 36, 7:318 (July), 1944.

Another Case of the Ounce vs. the Pound—Ringworm of the scalp, it is alleged, is frequently found in many large cities in addition to New York, where several thousand children have been infected, the epidemic spreading for more than a year. Ultraviolet rays are used in case finding and x-ray in therapy. Communities now free of this disagreeable visitor are urged to adopt preventive measures.

LEWIS, G. M., *et al.* Measures to Prevent and Control an Epidemic of Ringworm of the Scalp. New York State J. Med., 44, 12:1327 (June 15), 1944.

Concerning Public Relations—Addressed particularly to water works operators this admonition to let staff members really know what is going on, might well have been broadened to include all public health administrators. Even with small staffs an employee publication is suggested—not necessarily a slick paper brochure, for a mimeographed sheet can do the job as well. It is what goes into the news letter that counts.

MCDONNELL, E. Does the Team Know the Score? J. Am. Water Works A. 36, 7:777 (July), 1944.

Anent Coffin Nails—Using ordinarily healthy smokers, these researchers found that smoking two standard cigarettes increased basal metabolic rates, speeded up heart action, and affected the electrocardiographic picture. Injecting 2 mg. of nicotin had the same effect but smoking corn-silk cigarettes did not. It is not likely that these findings will have any effect on your habits, but you should read the paper.

ROTH, G. M., *et al.* The Effect of Smoking Cigarettes. J.A.M.A. 125, 11:761 (July 15), 1944.

Ill-Wind Department — Maternal hygienists will be interested in these conclusions: patients allowed out of bed 3 or 4 days postpartum feel stronger and better able to resume routine duties than do those kept in bed the usual 12 days. Involution of the uterus was accelerated, no phlebitis occurred and there were no complications due to the early rising.

ROTSTEIN, M. L. Getting Patients Out of Bed Early in the Puerperium. J.A.M.A. 125, 12:838 (July 22), 1944.

An Apple a Day—Four papers that you should not miss are these on the state of our physical fitness, based upon experience in the examination of 13 million young Americans called for the

army, the examination of high school students for the Victory Corps, and on work with industrial employees. It would seem that national fitness is a project in which all health workers might make a contribution, so it is a pleasure to find prominent members of the A.P.H.A. among the writers and discussants in this symposium.

ROWNTREE, L. G National Program for Physical Fitness (and three related papers). J A M A 125, 12 821 (July 22), 1944.

Midges Are the Vectors—If you are intent upon keeping up with all the weird variety of tropical infections which returned soldiers will bring to your community, you may want to refresh your knowledge of phlebotomus fever. If you do, this paper, with its all-inclusive title, seems to be an excellent medium for that purpose.

SABIN, A. B., *et al.* Phlebotomus (Pappataci or Sandfly) Fever: A Disease of Military Importance, Summary of Existing Knowledge and a Preliminary Report of Original Investigations. J.A.M.A. 125, 9:603 (July 1), 1944.

More Good Penicillin News—Six of eight ophthalmia neonatorum patients treated with penicillin showed pronounced clinical improvement within 24 hours and complete recovery in from 3 to 6 days.

SIEVERS, J. J., *et al.* Penicillin in the Treatment of Ophthalmia Neonatorum. J.A M.A 125, 10:690 (July 8), 1944.

The Stork Was Busy—During the first war year more babies were born in these United States than ever before and maternal deaths, infant deaths, and stillbirths were at their lowest. If that introductory statement doesn't send you to this excellent summary, then your statistical soul must be dead.

YERUSHALMY, J. Births, Infant Mortality, and Maternal Mortality in the United States —1942. Pub. Health Rep. 59, 25:797 (June 23), 1944.

The Frances Stern Food Clinic

At a recent meeting of the Administrative Committee of the Tufts College Medical School, Boston, a Committee on Nutrition was appointed to be designated The Frances Stern Committee on Nutrition in recognition of the teaching of applied dietetics for the past 16 years by Miss Stern and her associates at the Food Clinic of the Boston Dispensary as a part of the course in clinical medicine. The Food Clinic of the Dispensary is now called The Frances Stern Food Clinic by a vote of the Board of Managers at the Silver Anniversary in 1943 as a tribute to its founder.

According to a recent announcement by the Medical School, the Charles Hood Dairy Foundation will contribute annually for three years half the estimated costs for a professor of nutrition at the Medical School, the work to be an integral part of both pre-clinical and clinical medicine and to include research. Prior to the appointment of such a person a study of nutrition in relation to medical teaching is under way.

BOOKS RECEIVED

FUNDAMENTALS OF INTERNAL MEDICINE. By Wallace Mason Yater. 2nd ed. New York: D. Appleton-Century, 1944. 1204 pp. Price, $10.00.

THE MICROBIOLOGY OF FOODS. By Fred Wilbur Tanner. 2nd ed. Chicago: Garrard Press, 1944. 1196 pp. Price, $12.50.

THE MICROBIOLOGY OF MEATS. By L. B. Jensen. Chicago: The Garrard Press, 1942. 252 pp. Price, $4.00.

SIMPLIFIED DIABETIC MANAGEMENT. By J. T. Beardwood, Jr., and H. T. Kelly. 4th ed. Philadelphia: Lippincott, 1944. 172 pp. Price, $1.50.

PUBLIC WORKS ENGINEERS' YEARBOOK, 1944. Including the Proceedings of the 1943 Public Works Congress Held at Chicago, Illinois. Chicago: American Public Works Association, 1944. 320 pp. Price, $3.75.

OCCUPATIONAL THERAPY IN THE TREATMENT OF THE TUBERCULOUS PATIENT. By Holland Hudson and Marjorie Fish. New York: National Tuberculosis Association, 1944. 336 pp. Price, $3.00.

THE ART OF ANALSTHESIA. By Paluel J. Flagg. 7th ed. Philadelphia: Lippincott, 1944. 519 pp. 166 illus. Price, $6.00.

BEHAVIOR CHANGES RESULTING FROM A STUDY OF COMMUNICABLE DISEASES. By John Urban. Contributions to Education No. 896. New York: Bureau of Publications, Teachers College, Columbia University, 1943. 110 pp. Price, $1.85.

HYPERTENSION AND HYPERTENSIVE DISEASE. By William Goldring and Herbert Chasis. New York: Commonwealth Fund, 1944. 253 pp. Price, $3.50.

REBEL WITHOUT A CAUSE. THE HYPNOANALYSIS OF A CRIMINAL PSYCHOPATH. By Robert M. Lindner. New York: Grune & Stratton, 1944. 310 pp. Bibliography and Index. Price, $4.00.

STAY YOUNG AND LIVE. COMMON SENSE ABOUT HEALTH IN WAR TIME. By J. Clarence Funk. Virginia: The Dietz Press, Inc., 1943. 125 pp. Price, $1.75.

YOU ARE YOUNGER THAN YOU THINK. By Martin Gumpert. New York: Duell, Sloan and Pearce, 1944. 244 pp. Price, $2.75.

HEALTH AND FIRST AID By Morris Fishbein and Leslie W. Irwin. New York: Lyons & Carnahan, 1944. 372 pp. Price, $1.11.

SCHOOLS AND MANPOWER—TODAY AND TOMORROW. Washington, D. C.: American Association of School Administrators, 1943. 448 pp. Price, $2.00.

MITCHELL'S PEDIATRICS AND PEDIATRIC NURSING. Revised by Robert A. Lyon and Winifred Kaltenbach. 2nd ed. Philadelphia: Saunders, 1944. 504 pp. 97 illus. Price, $3.00.

BABY CARE DURING EXPECTANCY AND ITS FIRST YEAR. A Helpful Guide for Mothers on the Care of Infants. By May E. Law. Philadelphia: Lippincott, 1943. 13 booklets. Price, $1.25.

MOSQUITO CONTROL. PRACTICAL METHODS FOR ABATEMENT OF DISEASE VECTORS AND PESTS. By William Brodbeck Herms and Harold Farnsworth Gray. 2nd ed. Revised and enlarged. New York: Commonwealth Fund, 1944. 419 pp. Price, $3.50.

PROCEEDINGS AND PAPERS OF THE THIRTEENTH ANNUAL CONFERENCE OF THE CALIFORNIA MOSQUITO CONTROL ASSOCIATION. Edited by Harold Farnsworth Gray. Berkeley: State Bureau of Sanitary Engineering, 1944. 135 pp. Price, $1.50.

TECHNIQUES OF SUPERVISION IN PUBLIC HEALTH NURSING. By Ruth B. Freeman. Philadelphia: Saunders, 1944. 411 pp. Price, $2.75.

DELEE'S OBSTETRICS FOR NURSES. By M. Edward Davis and Mabel C. Carmon. 13th ed. Philadelphia: Saunders, 1944. 597 pp. 306 illus. Price, $3.00.

HANDBOOK OF NURSING IN INDUSTRY. By M. Gray Macdonald. Philadelphia: Saunders, 1944. 226 pp. Price, $2.50.

BUILDING FOR SAFE LIVING. By Olis G. Jamison, Earl A. Johnson and Ralph Watson. Illus. Boston: Heath, 1944. 152 pp. Price, $.60.

HEALTH EDUCATION FOR ALL AGES. Compiled by Lili Heimers. Edited by Margaret G. Cook. Upper Montclair, N. J.: New Jersey State Teachers College, 1944. 36 pp. Price, $.75.

SUBSTANDARD CONDITIONS OF LIVING. A Study of the Cost of the Emergency Sustenance Budget in Five Textile Manufacturing Communities in January–February, 1944. By Research Department, Textile Workers Union of America, CIO. New York: The Textile Workers Union of America, 1944. 94 pp. (Single copies free from Publisher, 15 Union Square, New York 3, N. Y.)

CARRION'S DISEASE. IMMUNOLOGIC STUDIES. By Calderon Howe. Chicago: American Medical Association, 1943. 21 pp.

COMMUNITY HEALTH AND WELFARE EXPENDITURES IN WARTIME, 1942 AND 1940. 30 URBAN AREAS. By Edward E. Schwartz and Eloise R. Sherman. Washington, D. C.: Children's Bureau, 1944. Bureau Publication 302. 70 pp.

ASSOCIATION NEWS

SECOND WARTIME PUBLIC HEALTH CONFERENCE AND SEVENTY-THIRD ANNUAL BUSINESS MEETING AMERICAN PUBLIC HEALTH ASSOCIATION

New York, N. Y., October 3–5, 1944
Headquarters: Hotel Pennsylvania

RATES QUOTED BY NEW YORK HOTELS

Second Wartime Public Health Conference and Seventy-third Annual Business Meeting—October 3–5, 1944

	Rooms Without Bath		*Rooms With Bath*	
	Single	*Double*	*Single.*	*Double*
Headquarters:				
Pennsylvania, 7th Ave. & 33rd St.			$3.85– 6.60	$5.50– 8.80
Hotels near Hotel Pennsylvania:				
Governor Clinton, 7th Ave. & 31st St.			3.30– 5.50	4.40– 7.70
Martinique, Broadway & 32nd St.	$2.00–2.50	$3.00–4.00	2.75– 3.85	3.85– 5.95
McAlpin, Broadway & 34th St.	2.20–2.75	3.85–4.40	3.30– 6.60	4.95– 8.80
New Yorker, 8th Ave. & 34th St.			3.85– 8.80	5.50–11.00
Allerton House, 143 East 39th St.	2.00–2.25		2.75– 3.00	
Allerton House for Women, 130 East 57th St.	2.00–2.50		3.00– 3.50	
Ambassador, Park Ave. & 51st St.			6.00– 8.00	$8.00–10.00
Astor, Broadway & 44th St.			3.50– 5.00	6.00– 8.00
Barbizon (Women), Lexington Ave. & 63rd St.	2.00–2.75	3.50–4.50	3.25– 3.75	4.50– 5.50
Barclay, 111 East 48th St.			6.00– 7.00	8.00–10.00
Belmont Plaza, Lexington Ave. & 49th St.			4.00– 5.50	6.00– 8.00
Beverly, Lexington Ave. & 50th St.			5.00– 6.00	7.00– 8.00
Biltmore, Madison Ave. & 43rd St.			5.50–12.00	7.50–14.00
Bristol, 129 West 48th St.	1.75–2.00	3.00	2.50– 4.00	3.50– 6.00
Capitol, 8th Ave. & 51st St.	2.50		3.50– 4.00	5.00– 6.00
Carlyle, Madison Ave. & 76th St.			6.00– 7.00	8.00– 9.00
Chesterfield, 130 West 49th St.	1.50–2.00	2.50–3.00	2.50– 3.00	4.00– 6.00
Commodore, Lexington Ave. & 42nd St.			3.50– 5.50	5.50– 8.80
Concourse Plaza, Grand Concourse & 161st St.			3.50– 4.50	5.50– 6.50
Cornish Arms, 311 West 23rd St.			2.25– 3.00	4.00– 4.25
Essex House, 160 Central Park South			6.00– 8.00	8.00–10.00
Fifth Avenue Hotel, 24 Fifth Ave. (9th St.)			5.00– 6.00	7.00– 8.00
Henry Hudson, 353 West 57th St.			2.50– 3.00	3.50– 5.00
Kenmore Hall, 145 East 23rd St.	1.50–2.00	2.50–3.00	2.00– 3.50	3.50– 5.00
Lexington, 48th St. & Lexington Ave.			4.00– 6.00	6.00– 8.00
Luxor Baths Hotel, 121 West 46th St.			2.25– 2.75	4.50– 5.50
Midston House, 22 East 38th St.	2.25–2.50		3.50	4.00– 4.50
New Weston, Madison Avenue & 50th St.			4.00– 6.00	6.00– 9.00
Paramount, 46th St. West of Broadway			3.00– 4.50	4.00– 8.00
Park Central, 7th Ave. & 55th St.			4.00– 5.00	6.00– 8.00
Parkside, 18 Gramercy Park South	2.25		2.75– 3.30	5.00– 6.00
Piccadilly, 227 West 45th St.			3.00– 4.00	4.50– 6.00
Plymouth, 143 West 49th St.			2.50– 3.50	4.00– 5.00
President, 234 West 48th St.			2.50– 4.00	4.00– 5.00
Prince George, 14 East 28th St.			2.50– 4.00	4.00– 7.00
Roosevelt, Madison Ave. & 45th St.			4.50– 8.00	6.50–12.00
Shelton, 49th St. & Lexington Ave.	2.50		3.50– 5.00	5.00– 7.00
Taft, 7th Avenue & 50th St.	2.00–2.50	3.50–4.00	2.50– 5.00	3.50– 8.00
Times Square, 43rd St. & 8th Ave.	2.00–2.50	3.00–3.50	2.25– 3.00	4.00– 5.00
Tudor, 304 East 42nd St.			2.50– 4.00	4.00– 6.00
Victoria, 7th Ave. & 51st St.			3.00– 4.00	4.50– 7.00
Waldorf-Astoria, 50th St. & Park Ave.			7.00–10.00	10.00–12.00
Warwick, 54th St. & 6th Ave.			5.00– 6.00	7.00– 8.00
Wellington, 7th Ave. & 55th St.			3.00– 5.00	4.00– 7.00
Woodstock, 127 West 43rd St.	2.00–2.50	3.50–4.00	3.00– 5.00	4.00– 7.00

NEW YORK LOCAL COMMITTEE

HON. F. H. LAGUARDIA, Mayor, City of New York, *Honorary Chairman*

ERNEST L. STEBBINS, M.D., Commissioner of Health, City of New York, *General Chairman*

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MATTHEW A. BYRNE, Secretary, New York City Department of Health, *Treasurer*

EXECUTIVE COMMITTEE

ERNEST L. STEBBINS, M.D., Commissioner of Health, City of New York, *Chairman*

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MATTHEW A. BYRNE, Secretary, New York City Health Department

FRANK KIERNAN, Director, New York Tuberculosis and Health Association

BERNARD S. COLEMAN, Secretary, New York Tuberculosis and Health Association

DAVID RESNICK, Director of Public Relations, National Society for the Prevention of Blindness

CHARLES A. FRECK, Executive Director, Queensboro Tuberculosis and Health Association, Inc.

LEVERETT D. BRISTOL, M.D., Executive Director, Hospital Council of Greater New York

APPLICANTS FOR FELLOWSHIP

In accordance with the By-laws of the Association, the names of applicants for Fellowship are officially published herewith. They have requested affiliation with the Sections indicated. Action by the various Section Councils, the Committee on Eligibility, and the Governing Council will take place at the Wartime Conference.

Health Officers Section

Samuel D. Allison, M.D., M.P.H., Venereal Disease Control Officer, Territorial Board of Health, Honolulu, T. H.

Will H. Aufranc, M.D., M.P.H., Surgeon (R), U. S. Public Health Service; Venereal Disease Control Officer, State Board of Health, Portland, Ore.

Floyd C. Beelman, M.D., Secretary and Executive Officer, State Board of Health, Topeka, Kans.

Ruth E. Church, M.D., M.S.P.H., Medical Director, Washington County Health Unit and District Health Service 7, Washington, Iowa

Harold M. Erickson, M.D., M.P.H., Assistant State Health Officer, Portland, Ore.

Stanford F. Farnsworth, M.D., M.P.H., Health Officer, Oakland, Calif.

Warren F. Fox, M.D., Riverside County Health Officer, Riverside, Calif.

Donald K. Freedman, M.D., Health Officer, Newport News, Va.

Clifton F. Hall, M.D., M.P.H., Director, Mecosta-Osceola Health Department, Big Rapids, Mich.

Austin E. Hill, M.D., M.P.H., Director of Public Health, Houston, Tex.

Lt. Commander Harold Jacobziner, USN, Acting Sanitation Officer and Quarantine Officer, Norfolk Navy Yard, Portsmouth, Va.

Irvin Kerlan, M.D., C.P.H., Medical Officer, U. S. Food and Drug Administration, Washington, D. C.

James P. O'Brien, M.D., C.P.H., District Health Officer, Northern Health Unit, Woonsocket, R. I.

Major Frank W. Parker, Jr., M.C., Chief, Preventive Medicine Branch, Medical Section, Headquarters First Air Force, USAAF, Mitchel Field, N Y.

Rolla J Shale, M D., M.S P.H., City-County Health Officer, Helena, Mont.

Cecil A. Z. Sharp, M.D., M.S.P.H., Will County Health Officer, Joliet, Ill.

Wilfred N. Sisk, M.D., M.P.H., Director and Health Officer, Buncombe County Health Department, Asheville, N. C.

Hubert O. Swartout, M.D., Dr.P.H., Los Angeles County Health Officer, Los Angeles, Calif.

Jules R. Thebaud, D.D.S, Director General, National Public Health Service, Port-au-Prince, Haiti

Glen S. Usher, M.D., Chief, Bureau of Venereal Disease Control, State Health Department, Trenton, N. J.

Benjamin F. Wyman, M.D., State Health Officer, Columbia, S. C.

Laboratory Section

Luther A. Black, Ph.D., Senior Bacteriologist, U. S. Public Health Service, Cincinnati, O.

Donald C. A. Butts, D.Sc., Associate Professor of Bacteriology and Tropical Diseases, Georgetown University School of Medicine, Washington, D. C.

Geoffrey Edsall, M.D., Acting Director, Division of Biologic Laboratories, State Department of Public Health, Boston, Mass.

Carolyn R. Falk, B.A., Bacteriologist, Department of Health, New York, N. Y.

Stanley E. Hartsell, Ph.D., Associate Professor of Bacteriology, Purdue University, W. Lafayette, Ind.

Nell Hirschberg, Ph.D., Associate Bacteriologist, U. S. Public Health Service, Raleigh, N. C.

Melvin E. Koons, M.P.H., Director, Division of Laboratories, State Department of Health, Grand Forks, N. D.

Malcolm H. Merrill, M.D., Chief, Division of Laboratories, State Department of Public Health, Berkeley, Calif.

Pablo Morales Otero, M.D., Director and Professor of Bacteriology and Immunology, School of Tropical Medicine, San Juan, P. R.

Robert M. Perlman, M.D., M.S.P.H., Assistant Surgeon (R), National Cancer Institute, Bethesda, Md.

Leslie A. Sandholzer, Ph.D., Associate, U. S. Department of the Interior, College Park, Md.

Anna M. Sexton, Librarian, Division of Laboratories and Research, State Department of Health, Albany, N. Y.

Aimee Wilcox, Assistant Protozoologist, U. S. Public Health Service, Memphis, Tenn.

Vital Statistics Section

Anthony J. Borowski, Dr.P.H., Assistant in Biostatistics, Medical College of Virginia, and Statistician and Chief Clerk, Health Department, Richmond, Va.

Cornelius M. Bowen, Health Officer and Registrar of Vital Statistics, Boroughs of Westwood and Haworth, Westwood, N. J.

Clara E. Councell, M.S., Medical Research Officer, Office of Coordinator of Inter-American Affairs, Washington, D. C.

Paul M. Densen, D.Sc., Assistant Professor of Preventive Medicine and Public Health, Vanderbilt University Medical School, Nashville, Tenn.

Forrest E. Linder, Ph.D., Assistant Chief Statistician, Bureau of the Census, Washington, D. C.

Frances A. Macdonald, A.B. (formerly Director, Bureau of Vital Statistics, Board of Health, Hartford, Conn.)

Alan E. Treloar, Ph.D., Associate Professor of Biostatistics, School of Public Health, University of Minnesota, Minneapolis, Minn.

Engineering Section

Raymond F. Goudey, M.S.C.E., Sanitary Engineer, Department of Water and Power, Los Angeles, Calif.

John M. Henderson, C.E., Senior Sanitary Engineer (R), U. S. Public Health Service, Atlanta, Ga.

Glen J. Hopkins, B.S.C.E., Director, Division of Engineering, State Board of Health, Pierre, S. D.

Nelton H. Rector, B.E.C.E., Sanitary Engineer (R), U. S. Public Health Service, Atlanta, Ga.

Industrial Hygiene Section

Allen D. Brandt, Sc.D., Sanitary Engineer, U. S. Public Health Service, Chicago, Ill.

Irving Gray, M.D., Practitioner of Industrial Medicine; Member, Public Health Committee, and Chairman, Committee on Industrial Health, Kings County Medical Society; Member, Public Health Committee, Brooklyn Chamber of Commerce, Brooklyn, N. Y.

Food and Nutrition Section

Ernestine Becker, M.A., Associate in Biochemistry and Nutrition, Johns Hopkins School of Hygiene and Public Health, Baltimore, Md.

Anna E. Boller, Ph.B., Chief Dietitian, Central Free Dispensary, Rush Medical College, Chicago, Ill.

Lt. Col. Cecil G. Dunn, Q.M.C., Chief, Dehydration Section, Office of the Quartermaster General, U. S. Army, Washington, D. C.

Lloyd A. Hall, Sc.D., Chief Chemist, The Griffith Laboratories, Chicago, Ill.

Norman H. Jolliffe, M.D., Chief, Medical Service, Psychiatric Division, Bellevue Hospital, and Lecturer in Public Health Practice, College of Physicians and Surgeons, New York, N. Y.

Gordon W. Molyneux, Supervising Milk Inspector, Westchester County Department of Health, White Plains, N. Y.

Pearl Rorabaugh, M.S., Nutritionist, State Department of Health, Topeka, Kans.

Fredrick J. Stare, M.D., Ph.D., Associate Professor of Nutrition, Harvard School of Public Health, Boston, Mass.

Maternal and Child Health Section

Paul R. Ensign, M.D., M.P.H., Pediatric Consultant, State Department of Health, Atlanta, Ga.

Major Samuel B. Kirkwood, M.C., Ashford General Hospital, West Virginia (formerly Instructor in Obstetrics and Maternal Health, Harvard Medical School and School of Public Health)

Martha A. O'Malley, M.D., M.P.H., Assistant in Child Hygiene, Harvard School of Public Health, Boston, Mass.

Louis Spekter, M.D., M.P.H., Chief, Division of Crippled Children, State Department of Health, Hartford, Conn.

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Public Health Education Section

Jean Christopher, M.S.P.H., Health Education Consultant, State Department of Public Health, Springfield, Ill.

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Philip L. Riley, M.A., Directing Supervisor, Bureau of Physical Welfare, Board of Education, Cleveland, Ohio

Lewis C. Robbins, M.D., M.P.H., Director, Wichita Health Unit, Wichita Falls, Tex.

Mabel E. Rugen, Ph.D., Associate Professor of Health Education, School of Public Health, University of Michigan, Ann Arbor, Mich.

Public Health Nursing Section

Bertha L. Allwardt, R.N., B.S., Associate Public Health Nursing Consultant, U. S. Public Health Service, Dallas, Tex.

Ada M. Beerstecher, R.N., M.A., Executive Secretary, Community Health and Civic Association, Ardmore, Pa.

Zella Bryant, R.N., Assistant Chief Nurse, Nursing Section, Medical Division, Office of Civilian Defense, U. S. Public Health Service, 610 South Canal, Room 852, Chicago, Ill.

Elizabeth Curtis, R.N., M.A., Assistant Public Health Nursing Consultant, U. S. Public Health Service, New Orleans, La.

Josephine L. Daniel, R.N., B.S., Director, Division of Public Health Nursing, State Health Department, Oklahoma City, Okla.

Winifred Devlin, R.N., M.S., Instructor in Public Health Nursing and Field Coordinator, School of Nursing, Catholic University, Washington, D. C.

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Theodora A. Floyd, R.N., M.A., Regional Consultant Nurse, U. S. Children's Bureau, Atlanta, Ga.

Ruth B. Freeman, R.N., A.M., Associate Professor and Director, Course in Public Health Nursing, School of Public Health, University of Minnesota, Minneapolis, Minn.

Lillian A. Gardiner, R.N., M.S., Director, Division of Public Health Nursing, Territorial Department of Health, Juneau, Alaska

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Edna S. Gould, R.N., B.S., Field Coordinator and Instructor of Public Health Nursing, Indiana University, Bloomington, Ind.

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Hazel G. Herringshaw, R.N., M.Ed., Assistant Professor of Public Health Nursing, University of Michigan, Ann Arbor, Mich.

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A. Louise Kinney, R.N., M.A., Director, Division of Public Health Nursing, St. Louis University School of Nursing, St. Louis, Mo.

Florence Manley, R.N, M.A, District Supervising Nurse, State Department of Health, Buffalo, N. Y.

Lucy E. Massey, R N., M.A., Nurse Member, School Health Coordinating Unit, State Board of Health, Jackson, Miss.

Anne H. McCabe, R.N., M.A., Director, Division of Public Health Nursing, Westchester County Health Department, White Plains, N. Y.

Marion I. Murphy, R.N., B.S., Assistant Director, Bureau of Public Health Nursing, State Department of Health, Lansing, Mich.

Hope Newell, R.N., B.S., Executive Secretary, National Classification Committee, National Nursing Council for War Service, New York, N. Y.

Laura E. Peck, R.N., B.S., Supervisor and Consultant, Communicable Disease Nursing, Department of Health, Detroit, Mich.

Lucile A. Perozzi, R.N., M.A., Regional Public Health Nursing Consultant, U. S. Children's Bureau, Washington, D. C.

Elisabeth C. Phillips, R.N., M.A., Assistant Director, Visiting Nurse Service of New York, New York, N. Y.

M. Caroline Quigley, R.N., C.P.H., Assistant Director, Division of Public Health Nursing, State Department of Health, New Orleans, La.

Dorothy I. Rusby, R.N., M.A., Assistant Director, National Organization for Public Health Nursing, New York, N. Y.

Ethel C. Ryckman, R.N., B.S., Supervising Nurse, Hillsdale County Health Department, Hillsdale, Mich.

Hazel Shortal, R.N., B.S., Instructor, St. Louis University, St. Louis, Mo.

Ruth G. Taylor, R.N., M.A., Director, Nursing Unit, U. S. Children's Bureau, Washington, D. C.

Alberta B. Wilson, R.N., M.S., Director, Division of Public Health Nursing, State Board of Health, Dover, Del.

Epidemiology Section

Eugene P. Campbell, M.D., M.P.H., Field Director, Division of Health and Sanitation, Office of Coordinator of Inter-American Affairs, Guatemala City, Guatemala.

Lowell T. Coggeshall, M.D., Professor and Chairman, Department of Tropical Diseases, University of Michigan School of Public Health, Ann Arbor, Mich.

Lieut. Bernard D. Daitz, Sn.C., Chief, Reports and Statistics, Typhus Control Service, Allied Control Commission (overseas)

Samuel Hyman, M.D., M.P.H., District State Health Officer, Utica, N. Y.

William E. Mosher, Jr., M.D., M.P.H., Cortland County Commissioner of Health, Syracuse, N. Y.

Geraldo H. de Paula Souza, M.D., Dr.P.H., Director, Institute of Hygiene, Sao Paulo, Brazil

Capt. G. Harold Warnock, Laboratory Officer, Station Hospital (overseas) (formerly Epidemiologist, Nassau County Health Department, Mineola, N. Y.)

Robert S. Westphal, M.D., M.P.H., Assistant District Health Officer, State Health Department, Watervliet, N. Y.

School Health Section

Marjorie L. Craig, M.A., School Health Bureau Assistant, Metropolitan Life Insurance Co., New York, N. Y.

Eunice Lamona, R.N., A.B., Chief Nurse, City Board of Education, Los Angeles, Calif.

Solomon S. Lifson, M.A., C.P.H., Health Education Consultant, U. S. Public Health Service, New York, N. Y.

Genevieve R. Soller, R.N., M S.P.H., Coordinator, Community Health Service Project, State Department of Public Instruction, Ypsilanti, Mich.

Mary E. Spencer, Ph.D., Professor of Education, Boston College, and Director of Health Education, Malden Public Schools, Malden, Mass.

Dental Health Section

David B. Ast, D.D.S., M.P.H., Assistant Director for Oral Hygiene, State Department of Health, Albany, N. Y.

Thomas W. Clune, D.M.D., M.P.H., Public Health Dentist, State Department of Health, Providence, R. I.

Bion R. East, D.D S., Assistant Professor of Public Health Practice, DeLamar Institute of Public Health, Columbia University, New York, N. Y.

John W. Knutson, D.D.S., Dr.P.H., Dental Consultant to State Health Authorities, U. S. Public Health Service, Bethesda, Md.

Unaffiliated

Stuart W. Adler, M.D., Director, Division of Maternal and Child Health, State Department of Health, Albuquerque, N. M.

West J. Altenburg, Ph.D., New York State Representative, National Foundation for Infantile Paralysis, Albany, N. Y.

E. Harold Hinman, M.D., M.P.H. Chief of

Party, Institute of Inter-American Affairs, Mexico, D. F., Mexico

Samuel H. Hopper, Ph.D., P. A. Sanitarian (R), U. S. Public Health Service, Chapel Hill, N. C.

Capt. Nicholas C. Leone, Sn.C., Nutrition Officer, Allied Military Government (overseas)

John D. Long, M.D., D.Sc., Traveling Representative, Pan American Sanitary Bureau, Lima, Peru

Maurice C. O'Shea, M.D., School Medical Inspector, Board of Education, New York, N. Y.

Ralph M. Palmer, M.A., Consulting Chemical Engineer, New York, N. Y.

Solomon L. Pearlman, M.D., M.S.P.H., Director of Venereal Disease Clinics, Health Department, Chicago, Ill.

Lyon P. Strean, Ph.D., D.D.S., Scientific Director, Ayerst, McKenna and Harrison, Ltd., New York, N. Y.

APPLICANTS FOR MEMBERSHIP

The following individuals have applied for membership in the Association. They have requested affiliation with the sections indicated.

Health Officers Section

O. L. Bettag, M.D., Livingston County Sanatorium, E. Torrance Ave., Pontiac, Ill., Medical Director and Superintendent

Henry W. Godfrey, M.D., 14 Hancock St., Auburndale, Newton 66, Mass., Member, Newton Board of Health

William H. Johnson, M.D., 211 N. 52nd St., Philadelphia, Pa., Chief Clinician, Health Center

Leland S. Kleinschmidt, M.S., 4047 College Ave., Indianapolis, Ind., Chief, Health Services Section, Farm Security Administration

Rees S. Lloyd, M.D., Box 49, Corpus Christi, Tex., Director, Corpus Christi-Neuces County Health Unit

John C. Madden, 378 Centre St., Newton, Mass., Member, Newton Board of Health

J. Earle Parker, 27 Metacomet Rd., Waban 68, Mass., Member, Newton Board of Health

Rufus S. Reeves, M.D., 503 City Hall Annex, Philadelphia 7. Pa., Director of Public Health

Harlan H. Tyner, M.D., Court House, Warrensburg, Mo., Johnson County Health Officer

Bertha C. Wiseman, M.D., 408 Jefferson St., La Grange, Ky., Oldham County Health Officer

Laboratory Section

Geraldine R. Clarey, 1216 10th St., Fargo, N. D., Bacteriologist in charge, City of Fargo Public Health Laboratory

Col. J. Vincent Falisi, M.C., 7th Service Command Laboratory, Fort Omaha, Nebr., Commanding Officer

B. Scott Fritz, V.M.D., Wyeth Inc., Marietta, Pa., Director of Laboratories, Reichel Division

Abraham Horwitz, M.D., M.P.H., Bandera 140 2nd Piso Depto 1-A, Santiago, Chile, S. A., Student, Johns Hopkins School of Hygiene and Public Health

Sgt. James Perrotta, Laboratory Technician, U. S. Army General Hospital

John J. Sampey, M.S., 238 Lombard St., Philadelphia 47, Pa., Chief Chemist, Abbotts Dairies, Inc.

Lieut. Manny Sherman, Sn.C., Asst. Chief of Laboratory, U. S. Army Station Hospital

Capt. Lawrence L. Swan, M.C., Fort Leavenworth Station Hospital, Fort Leavenworth, Kans., Chief of Laboratory Service

Dr. Jose A. Valero-Martinez, Pinto a Viente 45, Caracas, Venezuela, S. A., Medico-jefe Unidad Sanitaria, Direccion de Salubridad

Engineering Section

Ora A. Dennis, M.S., Poston General Hospital, Poston, Ariz., Sanitarian, War Relocation Authority

Lieut. John C. Geyer, U.S.N.R., 1633 Fitzgerald Lane, Alexandria, Va., Officer in charge, Sanitary Engineering Section, Div. of Preventive Medicine, Navy Dept.

Harry L. Kadet, M.S., 451 Shepherd Ave., Brooklyn 8, N. Y., Student, Harvard School of Engineering

Edwin L. Ruppert, 1403 Smith Tower, Seattle 4, Wash., P.A. Engineer (R), U. S. Public Health Service; Public Health Engineer, State Health Dept.

James E. Wadlington, Marshall County Health Dept., Benton, Ky., Sanitarian

Industrial Hygiene Section

Arthur R. Anderson, State Dept. of Public Health, Nashville 3, Tenn., Junior Asst. Sanitarian, U. S. Public Health Service

Hugh M. Malcolmson, M.D., M.P.H., 1 St. John's Ave., Winnipeg, Manitoba, Canada, Director, Bureau of Industrial Hygiene, Provincial Dept. of Health

Walter M. Otey, M.D., 1101–3rd St., S.W., Roanoke, Va., Plant Physician, American Viscose Corp.

Food and Nutrition Section

A. June Bricker, 65 Wethersfield Ave., Hartford 6, Conn., Nutrition Director, Connecticut Dairy and Food Council

Lt. Col. Wendell H. Griffith, Sn.C., Chief, Nutrition Branch, Div. of Preventive Medicine, U. S. Army

Stroud Jordan, Ph.D., 120 Wall St., New York 5, N. Y., Food Technologist, American Sugar Refining Co.

John T. Knowles, Libby, McNeill & Libby, Blue Island, Ill., Manager, General Laboratories

Edward F. Kohman, Ph.D., 136 Gill Rd., Haddonfield, N. J., Research Chemist, Campbell Soup Co.

Donald J. Maveety, 449 W. 14th St., New York, N. Y., Chief Chemist, National Biscuit Co.

Elizabeth A. Ward, 216 Ford St., Ogdensburg, N. Y., Exec. Sec., St. Lawrence County Tuberculosis and Public Health Assn.

Public Health Education Section

German Castillo, M.D., M.P.H., la Calle N.O. 209. Managua, Nicaragua, C. A., Chief of Child and School Hygiene and Health Education, Direccion General de Sanidad

Ray O. Duncan, M.A., 401 Centennial Bldg., Springfield, Ill., Director of Health and Physical Education, State Office of Public Instruction

Lois M. Jund, 2223 West Third St., Dayton, Ohio, Jr. Staff Member, National Tuberculosis Assn.

James O. Kelley, M.S., 208 E. Wisconsin Ave., Milwaukee 2, Wis., Exec. Sec. and General Manager, The Medical Society of Milwaukee County

Elizabeth E. Marks, 229 Jefferson Ave., Peoria, Ill., Director of Health Education, Peoria County Tuberculosis Assn.

Myer Solis-Cohen, M.D., Room 503, City Hall Annex, Philadelphia. Pa., Asst. Director of Public Health

Capt. John M. Stockton, Sn.C., 174 S. Emerson Drive, Osborn, Ohio, Director of Industrial Health Education and Assistant to the Surgeon, Headquarters, Air Service Command, Patterson Field

Mary W. Swank, Box 1116, Panama City, Fla., Exec Sec., Bay County Tuberculosis and Health Assn.

Patricia G. White, Box 65, Shepherdstown, W. Va., Student, Yale University

Ruth C. White. M.Ed.. 195 Hancock St.. Dorchester 25, Mass., Exec. Sec., Malden Tuberculosis and Health Assn.

Louise Williams, State Board of Health, Jackson 113, Miss., Librarian

Public Health Nursing Section

Edith B. Baumgardner, R.N., 328 N. Mildred St., Charles Town, W. Va., County Health Nurse, Jefferson County Health Dept.

Eleanor Gochanour, R.N., M.A., 323 State Office Bldg., Providence, R. I., Asst. Consultant Nurse, U. S. Public Health Service

Neva Harris, R.N., District Health Service 3, Spencer, Iowa, Advisory Nurse, State Dept. of Health

Margaret E. Higgins, R.N., P. O. Box 1389, Juneau, Alaska, Public Health Nurse, Territorial Dept. of Health

Rosella Pencall, R.N., 329 S. Michigan Ave., Villa Park, Ill., Staff Nurse, DuPage County Health Dept.

Ensign Emma A. Sporer, N. C., U. S. Naval Air Station, BOQ, Glenview, Ill., Nurse, U.S.N.R.

Helen H. Sturges, Bluff, Utah, Home Nurse, St. Christopher's Mission for Navajos

Tirzah J. Sweet, R.N., Box 16, Vernon, Vt., Staff Nurse, State Dept. of Health

Epidemiology Section

Griffith E. Quinby, M.D., 852 Custom House, Chicago, Ill., Asst. Surgeon (R), Malaria Control in War Areas, U. S. Public Health Service

Lieut. Frank L. Springer, M.C., 2516 Paradise Point, Camp Lejeune, N. C., Epidemiologist, U. S. Navy

School Health Section

Abraham J. Brown, M.D., 1928 N. Seventh St., Philadelphia, Pa., School Medical Inspector, Board of Public Education

Robert W. Culbert, M.D., 36-06 208th St., Bayside, N. Y., Pediatrician in charge of Vocational High School and Mercentile Health Services, New York City Dept. of Health

Marie E. Currie-Frey, M.D., M.P.H., 105 East Upsal St., Philadelphia 19, Pa., Medical Supervisor, Philadelphia Public School System

Ruth Evans, M.A., 32 Spring St., Springfield, Mass., Acting Supervisor of Health and Physical Education, Springfield Public Schools

Christine Heiser, 112½ Fourth Ave. South, Lewistown. Mont., Public Health Nurse, State Board of Health

Mrs. Edward T. Hicks, Jr., R.N., P. O. Box 467, Harlan. Ky., Harlan City School Nurse

Florence I. Mahoney, M.D., University of Wisconsin, Madison, Wis., Assoc. Professor of Physical Education

Charles R. Messeloff, M.D., 1750 Grand Concourse, New York 57, N. Y., Supervising Cardiologist, Dept. of Health

Sara R. Steele, School Nurse Service, Board of Education, Philadelphia, Pa., Head Nurse

Dental Health Section

J Frank Hall, D.D.S., 1121 W. Michigan St., Indianapolis, Ind., Professor of Oral Surgery, School of Dentistry, Indiana University

Frederick F. Lauer, D.D.S., 312 Union St., Hackensack, N. J., Dental Supervisor, Bureau of Dental Health, State Dept. of Health

Barnet N. Levy, D.D.S., Medical College of Virginia, Richmond, Va., Research Asst. in Bacteriology and Operative Dentistry

Omar M. Seifert, D.D.S., 40 Granite St., Reno, Nev., Director of Dental Hygiene, State Dept. of Health

Alfred E. Seyler, D.D.S., 14615 E. Jefferson Ave., Detroit 15, Mich., Director of Children's Clinic, School of Dentistry, Univ. of Detroit

Raymond M. Walls, D.D.S., 48 E. Market St., Bethlehem, Pa., Consultant, U. S. Public Health Service Dist. 1 and Bethlehem School District

Unaffiliated

Mabel C. Campbell, R.N., 3877 Greenwood Ave., Oakland 2, Calif., President, Oakland Visiting Nurses

Dean A. Clark, M.D., 3918 Livingston St., N.W., Washington, D. C., Chief Medical Officer; Sr. Surgeon (R), U. S. Public Health Service, Office of Vocational Rehabilitation

Wilton M. Fisher, M.D., P. O. Box 156, Houston 1, Tex., Teacher of Public Health and Preventive Medicine, Baylor University

Katherine E. Hite, M.D., Dept. of Bacteriology and Parasitology, Univ. of Chicago, Chicago 37, Ill., Instructor

Norman S. Moore, M.D., 512 E. State St., Ithaca, N. Y., Clinical Director, Cornell University

Leon G. Schwartz, 283 Austin St., West Newton, Mass., Student, Middlesex University School of Veterinary Medicine

William M. Shanahan, M.D., 2740 Oahu Ave., Honolulu 15, Hawaii, Acting Director, Bureau of Mental Hygiene, Board of Health

DECEASED MEMBERS

Julia George, Berkeley, Calif., Elected Member 1920, Public Health Nursing Section

Wilhelm O. Johnson, Springfield, Mass., Elected Member 1939, Public Health Education Section

SELSKAR MICHAEL GUNN

Selskar Michael Gunn, Vice-President of the Rockefeller Foundation, and Executive Secretary of the A.P.H.A. and Editor of the JOURNAL from 1912 to 1918, died on August 2 at the age of 61.

Mr. Gunn was born in London, England, where he attended Kensington Park College. In 1900, he came to the United States and was graduated from Massachusetts Institute of Technology with a B.S. degree in 1905. He received a C.P.H. degree from the Harvard-M.I.T. School of Public Health in 1917. From 1905 to 1914, he served the Boston Biochemical Laboratory as bacteriologist; the Iowa State Board of Health in the same capacity; Orange, N. J., as Health Officer; and Massachusetts Institute of Technology as an instructor and later a professor in sanitary biology and public health. From 1914 to 1916, he was the Director of the Division of Hygiene of the Massachusetts Department of Health. Mr. Gunn was Associate Director of the Commission for the Prevention of Tuberculosis in France, functioning under the auspices of the Rockefeller Foundation and French health authorities from 1917 to 1920. For two years thereafter he was adviser to the Ministry of Health of Czechoslovakia, and in 1922 returned to France to become Director of the Paris Office of the International Health Board of the

Rockefeller Foundation, directing health work throughout Europe. He became Vice-President of the Rockefeller Foundation in 1927 and remained in Paris until 1932. From 1932 to 1937 he headed a Foundation program in China designed to reconstruct that nation's agricultural, educational, and health methods. He then returned to this country and engaged in Foundation work in New York. In 1941, the Foundation lent his services to the National Health Council to direct a three year study of voluntary health agencies in the United States. From January, 1943, to March, 1944, he had been lent by the Council to assist former Governer Herbert H. Lehman of New York, Director General of UNRRA. He served the Association as Vice-President in 1941, and at the time of his death was a member of the Governing Council.

A.P.H.A. MERIT SYSTEM UNIT REPORTS PROGRESS

Reginald M. Atwater, M.D., Director of the A.P.H.A. Merit System Unit established to prepare examination material for professional public health workers, announces that the Unit has completed 97 examinations in the field of public health for 18 states and 1 city. Examination material is now available for public health nurses, for administrative health officers, for laboratory workers, and for workers in environmental sanitation, both engineers and sanitarians. Test items are also available in the fields of nurse-midwifery and othopedic nursing.

Lillian Dick Long, Ph.D., is psychometrician for the Unit which is coöperating with state merit systems and civil service agencies and with the U. S. Public Health Service and the U. S. Children's Bureau.

Preliminary Program of the Scientific Sessions of the Second Wartime Public Health Conference and the 73rd Annual Business Meeting of the American Public Health Association, and Meetings of Related Organizations

New York, N. Y.

October 2, 3, 4, and 5, 1944

THE Annual Meeting Program Committee offers a preview of the content of scientific sessions planned in connection with the Second Wartime Public Health Conference and the 73rd Annual Business Meeting in New York, N. Y. In many instances, sessions are complete. In others, places are purposely left open for important matters which may develop before October. Inaccuracies and omissions are to be expected, and it is hoped they will be excused. The professional affiliations and addresses of speakers are not given, but a complete index to participants will be published in the final program, which will be distributed to all delegates at the Registration Desk, Hotel Pennsylvania. Registration headquarters will be opened at 9:30 A.M. on Monday, October 2.

MONDAY MEETINGS

AMERICAN ASSOCIATION OF PUBLIC HEALTH DENTISTS

9:30 A.M. Conference Room 3, Hotel Pennsylvania.

2:30 P.M. Conference Room 3, Hotel Pennsylvania.

AMERICAN FILM CENTER

8:00 P.M. Madhattan Room, Hotel Pennsylvania.

Demonstration of the Measurement of Audience Reaction to a Typical Motion Picture Film. ROBERT MERTON, PH.D.

AMERICAN PUBLIC HEALTH ASSOCIATION GOVERNING COUNCIL

2:30 P.M. First Meeting—Parlor 2, Hotel Pennsylvania.

MONDAY MEETINGS (Cont.)

AMERICAN SCHOOL HEALTH ASSOCIATION

2:30 P.M. First General Session—Roof Garden South, Hotel Pennsylvania.

Presiding: C. MORLEY SELLERY, M.D., *President*.

PRESENT-DAY TRENDS IN SCHOOL HEALTH PRACTICE

School Nursing Policies and Practices in Relation to School Health. GERTRUDE E. CROMWELL, R.N.

The School Physician's Approach to School Health Service. JOHN F. BURKE, M.D.

Physical Condition of Soldiers at Induction—What the Schools Might Do to Overcome Defects Shown. HENRY F. MACE, M.D.

Integration of Community Health Education and School Health Education. SUE HURST THOMPSON, M.D.

Rheumatic Fever as a Significant Finding. Speaker to be announced.

8:30 P.M. Second General Session—Roof Garden South, Hotel Pennsylvania.

Presiding: S. B. MCPHEETERS, M.D., and C. MORLEY SELLERY, M.D.

IMPORTANCE OF SCHOOL HEALTH IN A WARTIME WORLD OR IMPACT OF WAR ON THE SCHOOL HEALTH PROGRAM

The Results of the Course in Health and Human Relations for Teachers. HUBLEY R. OWEN, M.D.

The School's Responsibility for Mental Health as Revealed by War. GEORGE K. PRATT, M.D.

The Classroom Teacher Relates the Health Program to Wartime Needs. MARIE SWANSON.

Administrator's Viewpoint on the School Health Program. EUGENE B. ELLIOTT.

Presentation of William A. Howe Award.

AMERICAN SOCIAL HYGIENE ASSOCIATION

8:30 P.M. Salle Moderne, Hotel Pennsylvania—Open Meeting.

INDUSTRY VS. V.D.—A PROGRAM OF EDUCATION AND ACTION

Presiding: VICTOR G. HEISER, M.D.

Speakers:
R. E. GILLMOR
W. L. WEAVER, M.D.
ABRAHAM BLUESTEIN
PERCY SHOSTAC

MONDAY MEETINGS (Cont.)

SYMPOSIUM ON CANCER

9:30 A.M. Georgian Room, Hotel Pennsylvania.

Presiding: HERBERT L. LOMBARD, M.D.

Recent Progress in the Successful Treatment of Advanced Cancer. WILLIAM E. HOWES, M.D.

Discussion: IRA I. KAPLAN, M.D.

Possibilities in Cancer Case Finding. MORTON L. LEVIN, M.D.

Cancer Prevention Clinics. ELISE S. L'ESPERANCE, M.D.

Discussion: CATHERINE MACFARLANE, M.D.

Recent Advances in Cancer Research. WILLIAM H. WOGLOM, M.D.

Discussion: E. V. COWDRY, M.D.

2:30 P.M. Georgian Room, Hotel Pennsylvania.

Malignant Tumors in Relation to War Personnel. MAJOR MILTON J. FRIEDMAN, M.C.

Cancer Morbidity in the United States. SELWYN D. COLLINS, PH.D.

The Statistical Approach to Cancer Control in Massachusetts. EVELYN A. POTTER and MILDRED R. TULLY.

Discussion: ELEANOR J. MACDONALD.

The Need for Cancer Education in Secondary Schools. F. L. RECTOR, M.D.

Discussion: EDMUND G. ZIMMERER, M.D.

8:00 P.M. Georgian Room, Hotel Pennsylvania.

Presiding: LOUIS I. DUBLIN, PH.D.

The Rôle of Nonofficial Agencies in Cancer Control. J. LOUIS NEFF.

The Rôle of the Federal Government in Cancer Control. R. R. SPENCER, M.D.

The Rôle of State Health Departments in Cancer Control. LOUIS C. KRESS, M.D.

CONFERENCE OF INDUSTRIAL NURSING CONSULTANTS

10:00 A.M. North Ball Room, Hotel New Yorker.

2:00 P.M. North Ball Room, Hotel New Yorker.

MONDAY MEETINGS (Cont.)

CONFERENCE OF MUNICIPAL PUBLIC HEALTH ENGINEERS

10:00 A.M. 18th floor headquarters, Hotel Pennsylvania.

2:30 P.M. 18th floor headquarters, Hotel Pennsylvania.

CONFERENCE ON RECIPROCAL SANITARY MILK CONTROL

4:30 P.M. Roof Garden North, Hotel Pennsylvania.

CONFERENCE OF STATE AND PROVINCIAL PUBLIC HEALTH LABORATORY DIRECTORS

9:30 A.M. Conference Room 2, Hotel Pennsylvania.

2:00 P.M. Conference Room 2, Hotel Pennsylvania.

CONFERENCE OF STATE DIRECTORS OF PUBLIC HEALTH EDUCATION

9:30 A.M. Parlor F, Hotel New Yorker.

2:30 P.M. Parlor F, Hotel New Yorker.

CONFERENCE OF STATE DIRECTORS OF PUBLIC HEALTH NURSING

9:30 A.M. Panel Room, Hotel New Yorker.

2:30 P.M. Panel Room, Hotel New Yorker.

CONFERENCE OF STATE SANITARY ENGINEERS

9:30 A.M. Parlor A, Hotel Pennsylvania.

2:30 P.M. Parlor A, Hotel Pennsylvania.

8:00 P.M. Parlor A. Hotel Pennsylvania.

CONFERENCE OF TEACHERS OF PREVENTIVE MEDICINE

11:00 A.M. Salle Moderne, Hotel Pennsylvania.

2:30 P.M. Salle Moderne, Hotel Pennsylvania.

MONDAY MEETINGS (Cont.)

N.O.P.H.N. COLLEGIATE COUNCIL ON PUBLIC HEALTH NURSING EDUCATION

9:30 A.M. Parlor 2, Hotel Pennsylvania.

N.O.P.H.N. COLLEGIATE COUNCIL ON PUBLIC HEALTH NURSING EDUCATION AND COUNCIL OF FIELD REPRESENTATIVES

2:00 P.M. Madhattan Room, Hotel Pennsylvania.

N.O.P.H.N. COLLEGIATE COUNCIL ON PUBLIC HEALTH NURSING EDUCATION AND CONFERENCE OF STATE DIRECTORS OF PUBLIC HEALTH NURSING

7:45 P.M. Parlor 2, Hotel Pennsylvania.

N.O.P.H.N. COUNCIL OF FIELD REPRESENTATIVES

9:30 A.M. Parlor G, Hotel New Yorker.

N.O.P.H.N.—NEW YORK CITY MEMBERSHIP COMMITTEE

8:30 P.M. Ball Room, Hotel Pennsylvania.

Has Public Health Nursing Reached Its Destination? C.-E. A. WINSLOW, DR.P.H.

Educational Opportunities in Public Health Nursing. MARION W. SHEAHAN, R.N.

National Unity in Public Health Nursing. ALMA C. HAUPT, R.N.

NATIONAL PUBLICITY COUNCIL FOR HEALTH AND WELFARE SERVICES

9:30 A.M. Hotel New Yorker.

A CLINIC ON PRINTED MATTER

A practical analysis of printed pieces in the health field. Emphasis on selection of the kind of lay-out and copy which will best accomplish the particular job each piece is intended to do.

MONDAY MEETINGS (Cont.)

NATIONAL PUBLICITY COUNCIL FOR HEALTH AND WELFARE SERVICES (Cont.)

2:30 P.M. Hotel New Yorker.

A CLINIC ON RADIO

A clinical discussion of the various types of radio programs (dramatizations, interviews, talks, etc.) with emphasis on the advantages and limitations of each for carrying different kinds of health messages.

SESSIONS FROM TUESDAY, OCTOBER 3, TO THURSDAY, OCTOBER 5, INCLUSIVE

Hotel Pennsylvania

TUESDAY, 9:30 A.M.

LABORATORY

First Session—Salle Moderne

Presiding: C. A. PERRY, SC.D., *Chairman.*

Section Business.

Report of the Coördinating Committee on Standard Methods. *Chairman,* LIEUTENANT COLONEL A. PARKER HITCHENS, M.C.

Report of the Standard Methods Committee on Virus and Rickettsial Diseases. *Chairman,* THOMAS FRANCIS, JR., M.D.

Report of the Standard Methods Committee on Examination of Water and Sewage. *Chairman,* WALTER L. MALLMANN, PH.D

Report of the Standard Methods Committee on Examination of Milk and Milk Products. *Chairman,* ROBERT S. BREED, PH.D.

Report of the Standard Methods Committee on Biology of the Laboratory Animal. *Acting Chairman,* PAUL A. MOODY, PH.D.

Report of the Standard Methods Committee for Frozen Desserts and Ingredients. *Chairman,* FRIEND LEE MICKLE, SC.D.

Report of the Standard Methods Committee on Biological Products. *Acting Chairman,* HAROLD W. LYALL, PH.D.

Report of the Standard Methods Committee for the Examination of Shellfish. *Chairman,* JAMES GIBBARD.

Report of the Standard Methods Committee for the Examination of Germicides and Antibacterial Agents. *Chairman,* STUART MUDD, M.D.

TUESDAY, 9:30 A.M.

LABORATORY (Cont.)

Report of the Laboratory Section Representative on the Commission for the Study of Biological Stains. WILLIAM D. STOVALL, M.D.

Report of the Section Archivist. ANNA M. SEXTON.

FORUM DISCUSSION

DIAGNOSTIC PROCEDURES AND REAGENTS

Leader: WILLIAM D. STOVALL, M.D.

An open discussion of the Methods and Reagents presented in the forthcoming new (2nd) edition of the book published by the Standard Methods Committee on this subject with special emphasis on the chapters appearing in this edition for the first time.

HEALTH OFFICERS

First Session—Georgian Room

Presiding: JOSEPH H. KINNAMAN, M.D., *Chairman*

Section Business.

LOCAL HEALTH ADMINISTRATION

Panel Leader: C.-E. A. WINSLOW, DR.P.H.

Participants:
CARL E. BUCK, DR.P.H.
L. E. BURNEY, M.D.
HAVEN EMERSON, M.D.
T. PAUL HANLY, M.D.
J. ROY HEGE, M.D.
R. P. KANDLE, M.D.
G. F. MOENCH, M.D.
E. V. THIEHOFF, M.D.

ENGINEERING SECTION, CONFERENCE OF STATE SANITARY ENGINEERS, AND CONFERENCE OF MUNICIPAL PUBLIC HEALTH ENGINEERS

Joint Session—Madhattan Room

Presiding: SOL PINCUS, C.E., F. HOLMAN WARING, and J. LLOYD BARRON, C.E.

Report of the Committee on Post-war Sanitary Engineering Problems. *Chairman,* ALFRED H. FLETCHER.

Report of the Committee on Industrial Sanitation. *Chairman,* W. SCOTT JOHNSON.

Report of the Committee on Water Supply. *Chairman,* CHARLES R. COX.

Relationships between U. S. Public Health Service and State and Local Health Units. ELLIS S. TISDALE.

TUESDAY, 9:30 A.M.

EPIDEMIOLOGY

First Session—Ball Room

Presiding: GAYLORD W. ANDERSON, M.D., *Chairman.*

Some Insect Problems in World War II in Which DDT Powder Has Been Used. F. C. BISHOPP.

Efforts to Control Typhus in Mexican Villages and Rural Populations Through DDT and Other Measures. GEORGE C. PAYNE, M.D., CARLOS ORTIZ MARIOTTE, M.D., and FELIPE MALO JUVERA, M.D.

The Control of Typhus in Italy, 1943–44, by the Use of DDT. MAJOR CHARLES M. WHEELER, SN.C.

Applications of the Complement-Fixation Test in the Study of Rickettsial Diseases. IDA A. BENGTSON.

A Localized Epidemic of Acute Miliary Pneumonitis, Associated with the Handling of Pigeon Manure. RICHARD NAUEN, M.D., and ROBERT F. KORNS, M.D.

Recent Advances in the Knowledge of the Epidemiology of the Arthropod-borne Encephalitides. W. McD. HAMMON, M.D., and W. C. REEVES, PH.D.

Section Business.

INDUSTRIAL HYGIENE

First Session—Roof Garden South

Presiding: HERBERT G. DYKTOR, *Chairman.*

Industrial Hygiene and Labor. *Address of the Chairman.* HERBERT G. DYKTOR.

Labor's Growing Interest in Industrial Health. GEORGE ADDES.

SYMPOSIUM ON INDUSTRIAL HEALTH RECORDS

Uses and Value of Industrial Vital Statistics. RUTH R. PUTTER, DR.P.H.

The Industrial Health Examination. HARVEY BARTLE, M.D.

Nursing Records in Industry. ANNA FILLMORE, R.N.

The Industrial Hygiene Survey. J. J. BLOOMFIELD.

Legal Considerations. T. V. MCDAVITT.

Section Business.

SCHOOL HEALTH

First Session—Parlor C

Presiding: LEONA BAUMGARTNER, M.D., *Chairman.*

Section Business.

TUESDAY, 9:30 A.M.

FOOD AND NUTRITION

First Session—Roof Garden North

Presiding: DONALD K. TRESSLER, PH.D., *Chairman.*

NUTRITIONAL AND SANITARY ASPECTS OF FOOD EATEN OUTSIDE THE HOME

Retention of Vitamin Values in Large Scale Food Service. FAITH FENTON, PH.D.

Nutritional Problems that Arise in Large Scale Feeding Operations. LIEUTENANT COMMANDER C. M. MCCAY, H-V (S), USNR.

Making Food Handlers Health Conscious. H. A. MORGAN, JR., M.D., MRS ALBERTINE P. MCKELLAR, and TOM B MUSE.

Section Business:

Report of the Secretary. MARJORIE M. HESELTINE.

Report of the Coördinating Committee. *Chairman,* F. C. BLANCK, PH.D.

Report of the Committee on Microbiological Examination of Foods. *Chairman,* HARRY E. GORESLINE, PH.D.

Report of the Committee on Milk and Dairy Products. *Chairman,* J. A. KEENAN, PH D.

Report of the Committee on Foods (except milk). *Chairman,* BERNARD E. PROCTOR, PH D.

Report of the Joint Committee on Analyzing Frozen Desserts. *Chairman,* FREDERICK W. FABIAN, PH.D.

Report of the Committee on Nutritional Problems. *Chairman,* C. G. KING, PH D.

Report of the Committee on Membership and Fellowship. *Chairman,* RACHAEL L. REED.

Election of Officers.

Note: There will be a meeting of the Section Council immediately following this session.

VITAL STATISTICS

First Session—Parlor 2

Presiding: SELWYN D. COLLINS, PH.D., *Chairman.*

WAR AND THE BIRTH RATE

Historical paper on "War and the Birth Rate." LOUIS I. DUBLIN, PH.D.

Discussion: RICHARD N. WHITTIELD, M.D.

Recent Changes in the Birth Rate. A. W. HEDRICH, SC.D.

TUESDAY, 9:30 A.M.

VITAL STATISTICS (Cont.)

Discussion: J. V. DEPORTE, PH D.

Effect of the Increased Birth Rate on Public Health Programs. JOHN M. SAUNDERS, M.D.

Discussion: HAVEN EMERSON, M.D.

Effect of Increased Birth Rate on Future Population. P. K. WHELPTON.

Discussion: A J. LOTKA, D Sc

Committee Reports.

Section Business

TUESDAY, 2:30 P.M.

VITAL STATISTICS AND FOOD AND NUTRITION SECTIONS

Joint Session—Georgian Room

Presiding: SELWYN D. COLLINS, PH.D., and DONALD K. TRESSLER, PH.D.

STATISTICAL RESEARCH IN HUMAN NUTRITION

Statistics as an Essential Feature in Human Nutrition. E. J. BIGWOOD, M.D.

Clinical Tests of the Nutritional State. DOROTHY G. WIEHL and H. D. KRUSE, M.D.

Methods of Dietary Investigation. RUTH LOIS HUENEMANN.

Microanalytical Methods in Nutritional Surveys of Children. OTTO A. BESSEY, PH.D.

Statistical Methods in Using Anthropometric Data in the Field of Nutritional Research. RACHEL M. JENSS, SC.D.

Results of a Survey with Emphasis on Interpretation. WILLIAM D. ROBINSON, M.D.

INDUSTRIAL HYGIENE

Second Session—Roof Garden South

The Federal-State Rehabilitation Program. DEAN CLARK, M.D.

Industrial Diseases in the Beryllium Industry. Speaker to be announced.

Is Dermatophytosis a Significant Occupational Health Problem? Speaker to be announced.

Report of the Committee on Anthrax. *Chairman,* HENRY FIELD SMYTH, M.D.

TUESDAY, 2:30 P.M.

EPIDEMIOLOGY, HEALTH OFFICERS, LABORATORY, ENGINEERING AND SCHOOL HEALTH SECTIONS

Joint Session—Ball Room

Presiding: LIEUTENANT COLONEL GAYLORD W. ANDERSON, M.C.

THE CONTROL OF AIR-BORNE INFECTIONS

Epidemiologic Observations on the Application of Triethylene Glycol Vapor for Air Sterilization. EDWARD BIGG, M.D., BURGESS H. JENNINGS, and FRANKLYN C. W. OLSON.

Principles of Ultra-violet Disinfection of Enclosed Spaces. L. J. BUTTOLPH, SC.D.

Ultra-violet Light Control of Air-borne Infections in Naval Training Stations. LIEUTENANT (s.g.) STAFFORD M. WHEELER, M.C., USNR, LIEUTENANT (s.g.) HOLLIS S. INGRAHAM, USNR, M.C., ALEXANDER HOLLAENDER, PH.D., LIEUTENANT COMMANDER NICHOLAS D. LILL, M.C., USNR, and LIEUTENANT COMMANDER JACOB GERSHON-COHEN, M.C., USNR.

Irradiation of Classroom Atmospheres. THEODORE S. WILDER, M.D.

Prophylaxis of Respiratory Diseases in the Navy Through Mass Administration of Sulfadiazine. COMMANDER ALVIN F. COBURN, M.C., USNR.

Prophylaxis of Respiratory Diseases in the Army Air Force Through Mass Administration of Sulfonamide Drugs. CAPTAIN RICHARD HODGES.

DENTAL HEALTH

First Session—Parlor 2

Presiding: KENNETH A. EASLICK, D.D.S., *Chairman.*

Section Business.

A NATIONAL DENTAL CARE PROGRAM

Presentation of the Dental Problem. JOHN T. FULTON, D.D.S.

Services to be Rendered. VERN D. IRWIN, D.D.S.

Requirements for Safeguarding Interests of the Profession and the Public. CAPTAIN C. RAYMOND WELLS.

The Manpower Problem. BION R. EAST, D.D.S.

Administration of a National Dental Care Program. RICHARD C. LEONARD, D.D.S.

Methods of Financing. GEORGE A. NEVITT, D.D.S.

The Contribution of Dental Hygienists. MARGARET H. JEFFREYS.

The Contribution of Health Educators. ANNIE TAYLOR.

TUESDAY, 2:30 P.M.

MATERNAL AND CHILD HEALTH

First Session—Roof Garden North

Presiding: MYRON E. WEGMAN, M.D., *Chairman.*

MEDICAL SERVICES FOR MIGRANTS WITH SPECIAL EMPHASIS UPON CARE FOR MOTHERS AND CHILDREN

From the Point of View of Community War Services. HARRIET RINALDO.

Care of Mothers and Infants in Migratory Labor Camps. KATHERINE BAKER, R.N.

Health Services for School Children on Farms. Speaker to be announced.

Health Services in Migratory Labor Camps (War Food Administration Program). FREDERIC D. MOTT, M.D.

Section Business.

PUBLIC HEALTH EDUCATION

First Session—Madhattan Room

Presiding: CARL A. WILZBACH, M.D.

WHAT THE HEALTH OFFICER EXPECTS FROM THE HEALTH EDUCATOR AND VICE VERSA

Panel Leader: H. O. SWARTOUT, M.D.

Participants:
W. W. PETER, M.D.
W. W. BAUER, M.D.
LOUISA J. ESKRIDGE
HELEN MARTIKAINEN
D. A. DUKELOW, M.D.

Recognition of New Members and Fellows.

Report of Committee on Health Education in Hospitals, Out-Patient Departments and Clinics. *Chairman,* W. W. BAUER, M.D.

Section Business.

PUBLIC HEALTH NURSING

First Session—Salle Moderne

Presiding: MARION H. DOUGLAS, R.N., *Chairman.*

Section Business.

Psychosomatic Problems in Today's Health Program

(a) Public Health Aspects.

(b) Contribution of the Public Health Nurse to Prevention and Care.

(c) Preparation of the Public Health Nurse.

Speakers to be announced.

TUESDAY, 5:00 P.M.

NATIONAL COMMITTEE OF HEALTH COUNCIL EXECUTIVES

Conference Room 2

TUESDAY, 8:30 P.M.

FIRST GENERAL SESSION

Ball Room

Presiding: FELIX J. UNDERWOOD, M.D., *President,* American Public Health Association.

Addresses of Welcome:
THE HONORABLE FIORELLO H. LAGUARDIA
ERNEST L. STEBBINS, M.D., Commissioner of Health
EDWARD S. GODFREY, JR., M.D., State Commissioner of Health
LEVERETT D. BRISTOL, M.D.

Public Health as an International Problem. *Third Annual Delta Omega Lecture.* RAYMOND B. FOSDICK, LL.D.

Local Responsibility in Public Health Administration. JOHN J. SIPPY, M.D., *President-elect,* American Public Health Association.

Presentation of the Sedgwick Memorial Medal Award.

Reception to the President and the President-elect.

WEDNESDAY, 9:30 A.M.

EPIDEMIOLOGY

Second Session—Roof Garden South

Epidemiological Studies on Infectious Hepatitis. MAJOR W. P. HAVENS, JR., M.C., ROBERT WARD, M.D., and V. A. DRILL, PH.D.

Control Measures Against Importation of Disease by Men Returning from Overseas Duty. LIEUTENANT COLONEL JOHN W. R. NORTON, M.C.

Venereal Disease Epidemiology in Wartime. JOHN R. HELLER, JR., M.D.

Comparison of Mortality in Selective Service Registrants with Negative and Positive Serologic Tests for Syphilis. MURRAY C. BROWN, M.D.

The Distribution of Poliomyelitis Virus During an Epidemic in an Urban Area. HAROLD E. PEARSON, M.D., GORDON C. BROWN, SC.D., ROBERT C. RENDTORFF, SC.D., GERALD M. RIDENOUR, PH.D., and THOMAS FRANCIS, JR., M.D.

Field Study of the Prevalence of Clinical Manifestations of Dietary Inadequacy. WILLIAM J. DARBY, M.D., and D. F. MILAM, M.D.

WEDNESDAY, 9:30 A.M.

FIRST SPECIAL SESSION

Ball Room

Presiding: THOMAS PARRAN, M.D.

TODAY'S GLOBAL FRONTIERS IN PUBLIC HEALTH

For South America. MAJOR GENERAL GEORGE C. DUNHAM.

For China. SZEMING SZE, M.D.

For Great Britain. MELVILLE MACKENZIE, M.D.

For The United States. THOMAS PARRAN, M.D.

HEALTH OFFICERS AND FOOD AND NUTRITION SECTIONS

Joint Session—Georgian Room

Presiding: JOSEPH H. KINNAMAN, M.D., and DONALD K. TRESSLER, PH.D.

PUBLIC HEALTH NUTRITION SERVICES IN WARTIME

Panel Leader: CARL H. NEUPERT, M.D.

Participants:
VIVIAN DRENCKHAHN
L. L. FATHERREE, M.D.
FLORENCE B. HOPKINS, M.D.
M. H. KRONENBERG, M.D.
E. W. MCHENRY, PH.D.
I. H. MOORE, M.D.
MARIE NEUSCHAEFER, R.N.
MARY STANSEL

ENGINEERING

First Session—Parlor 2

Presiding: SOL PINCUS, C.E., *Chairman.*

TOOLS FROM THE WAR—AVAILABLE

A Demonstration in Food and Utensil Sanitation. MURRAY P. HORWOOD, PH.D.

Disinfection of Small Water Supplies. GORDON M. FAIR.

Bacteriological Improvements Obtained by the Practice of Break-point Chlorination. A. E. GRIFFIN and N. S. CHAMBERLIN.

Factors in Water Quality Control in the U. S. Army. COLONEL W. A. HARDENBERGH, SN.C.

Section Business.

WEDNESDAY, 9:30 A.M.

MATERNAL AND CHILD HEALTH AND PUBLIC HEALTH NURSING SECTIONS

Joint Session—Madhattan Room

Presiding: MYRON E. WEGMAN, M.D., and MARION H. DOUGLAS, R.N.

STREAMLINING HOSPITAL TECHNICS

From the Point of View of a Supervising Nurse on a Maternity Service. BERTHA PIERACCINI, R.N.

From the Point of View of a Public Health Nurse Examining Maternity Hospital Services for License. RUTH OLSEN, R.N.

From the Point of View of the Public Health Physician. VIKTOR O. WILSSON, M.D.

From the Point of View of the Epidemiologist. JAMES WATT, M.D.

LABORATORY

Second Session—Roof Garden North

Section Business.

A SERIES OF ABRIDGED PAPERS

Excretion of Typhoid Bacilli by Carriers—Comparative Value of Fecal and Bile Specimens in Their Detection. HOWARD J. SHAUGHNESSY, PH.D., and FRANCES FRIEWER.

The Laboratory Criteria of the Cure of Typhoid Carriers. ROY F. FEEMSTER, M.D.

Preparation of a Potent "Washed" Typhoid Vaccine. MORRIS F. SHAFFER, PH.D., LESLIE WETTERLOW and GEOFFREY EDSALL, M.D.

Meningococcus Typing. SARA E. BRANHAM, M.D.

Comparative Results Obtained with the Kahn Standard and a One-Tube Flocculation Procedure in Serologic Tests for Syphilis. SAMUEL R. DAMON, PH.D., and MAYME C. COLVIN.

Laboratory Diagnosis by Complement-Fixation. LIEUTENANT LOUIS H. MUSCHEL, SN.C.

The Effect of Environmental Temperature on Experimental Influenza in Mice. S. EDWARD SULKIN, PH.D.

An Outbreak of Food Poisoning Due to a New Etiological Agent—Salmonella Berta. GEORGE H. HAUSER, M.D., and W. L. TREUTING, M.D.

The Development in vitro of Penicillin-fast Strains of the Gonococcus. CHARLES M. CARPENTER, M.D.

Transportation of Gonococcus Specimens. NELL HIRSCHBERG, PH.D.

The Preparation of Crude Penicillin and Its Laboratory Use. LILLIAN BUXBAUM.

WEDNESDAY, 9:30 A.M.

LABORATORY (Cont.)

A New Method for the Determination of the Self-Sterilizing Ability of Parenteral Preparations. DWIGHT A. JOSLYN.

Non-Acid-Fast Forms of the Tubercle Bacillus as Shown by Improved Staining Technic. ELEANOR ALEXANDER-JACKSON, PH.D.

PUBLIC HEALTH EDUCATION AND SCHOOL HEALTH SECTIONS, AND THE AMERICAN SCHOOL HEALTH ASSOCIATION

Joint Session—Sal'e Moderne

Presiding: CHARLES C. WILSON, M.D.

CONTRIBUTION OF PUBLIC HEALTH WORKERS TO THE PREPARATION OF TEACHERS

New Developments in Teacher Education (with implications for health preparation). MAURICE TROYER, PH.D.

New Developments in Education of Public Health Personnel for School Health Work.

(a) Summary of Report of Committee on Qualifications of School Physicians. GEORGE M. WHEATLEY, M.D.

(b) Preparation of Public Health Nurses. RUTH FREEMAN, R N.

(c) Preparation of Public Health Dentists. KENNETH A. EASLICK, D.D.S.

(d) Preparation of Public Health Educators. LUCY S. MORGAN, PH.D

HOW CAN PUBLIC HEALTH WORKERS HELP MOST EFFECTIVELY IN THE IN-SERVICE PREPARATION OF TEACHERS FOR SCHOOL HEALTH WORK?

Panel Leader: MILTON J. ROSENAU, M.D.

Participants:
S. S. LITSON
JULES GILBERT, M.D.
REBA F. HARRIS
GENEVIEVE R. SOLLER, R.N.
MILDRED DOSTER, M.D.
WILLIAM BRISTOW, PH.D.

Training Institutions:
MAURICE TROYER, PH.D.
RUTH FREEMAN, R.N.

WEDNESDAY, 2:30 P.M.

GOVERNING COUNCIL

Second Meeting—Parlor 2

SECOND SPECIAL SESSION

Ball Room

Presiding: JOSEPH W. MOUNTIN, M.D.

CONTENT AND ADMINISTRATION OF A MEDICAL CARE PROGRAM

(Report by the Subcommittee on Medical Care of the Committee on Administrative Practice)

Introduction. JOSEPH W. MOUNTIN, M.D., *Chairman*

Unmet Health Needs. I. S. FALK, PH.D.

Scope, Administration and Financing of a National Health Service. NATHAN SINAI, D.P.H.

Local Administration. DAVID D. CARR, M.D., and J. ROY HEGE, M.D.

Hospitals and Hospital Construction. GRAHAM L. DAVIS.

Training of Personnel and Research. GEORGE ST. J. PERROTT.

Discussion: HUGH R. LEAVELL, M.D., and WILTON L. HALVERSON, M.D.

Open Discussion.

FOOD AND NUTRITION AND DENTAL HEALTH SECTIONS, AND AMERICAN SCHOOL HEALTH ASSOCIATION

Joint Session—Georgian Room

Presiding: MARIETTA EICHELBERGER, PH.D., KENNETH A. EASLICK, D.D.S., and LON W. MORREY, D.D.S.

GOOD SCHOOL HEALTH AS AFFECTED BY NUTRITION AND DENTAL HEALTH

New Trends of Various Public Health and Nutritional Activities in a School Program. J. T. PHAIR, M.B., D.P.H.

Integrating Nutrition Education and Activities in a School Program. MARGARET CHANEY, PH.D.

Nutrition and the Oral Tissues. MAURY MASSLER, D.D.S.

A Workable Public Health Dental Program. J. M. WISAN, D.D.S.

WEDNESDAY, 2:30 P.M.

SCHOOL HEALTH AND VITAL STATISTICS SECTIONS

Joint Session—Salle Moderne

Presiding: LEONA BAUMGARTNER, M.D., and SELWYN D. COLLINS, PH.D.

BASIC DATA FOR SCHOOL HEALTH PROGRAM

Physical Growth in Childhood and Military Fitness. ANTONIO CIOCCO, SC.D.

Basic Data for School Health Program. JEAN DOWNES.

Service Records and Their Administrative Uses. A. H. KANTROW, M.D., LEONA BAUMGARTNER, M.D., and HARRY GOOD.

Records of Medical Load in Schools. HAROLD H. MITCHELL, M.D.

An Index of the Prevalence of Dental Caries in School Children. ALAN E. TRELOAR, PH.D.

Discussion: HARRY STRUSSER, D.D.S., and BION R. EAST, D.D.S.

ENGINEERING AND INDUSTRIAL HYGIENE SECTIONS

Joint Session—Madhattan Room

Presiding: SOL PINCUS, C.E., and HERBERT G. DYKTOR.

Industrial Waste Disposal and Its Control. LORING F. OEMING.

Engineering Technic Applied to Food Handling. W. SCOTT JOHNSON.

Control and Abatement of Nuisances. FRANK M. STEAD.

Lessons Learned from the Internal Security Program. LIEUTENANT COLONEL WILLIAM H. WEIR, SN.C.

Tunnelling in the Tennessee Valley Authority. FRANK N. CHIRICO.

LABORATORY

Third Session—Roof Garden North

Five Years of the Verification Test. REUBEN L. KAHN, SC.D.

The Mechanism of Sulfonamide Action. M. G. SEVAG, PH.D.

On the Mechanism of Penicillin Action. C. H. WERKMAN, PH.D., and L. H. KRAMPITZ, PH.D.

Desiccation of Penicillin from the Frozen State. EARL M. FLOSDORF, PH.D.

A Study of the Types of Hypersensitivity Induced by Penicillin. HENRY WELCH, PH.D., and ADOLPH ROSTENBERG, JR., M.D.

Stability of Penicillin Sodium. WILLIAM A. RANDALL, PH.D., HENRY WELCH, PH.D., and ALBERT C. HUNTER, PH.D.

WEDNESDAY, 2:30 P.M.

PUBLIC HEALTH EDUCATION

Second Session—Roof Garden South

Presiding: CHARLES E. LYGHT, M.D.

HEALTH EDUCATION PRAXIS

Health Education Methods of the Red Cross. HARRY E. KLEINSCHMIDT, M.D.

Discussion: MARY P. CONNOLLY.

Tips and Tricks for the Practice. SAVILL ZIMAND.

Discussion: CHARLES F. WILINSKY, M.D.

An Experiment on Venereal Disease Education in Negro Schools. CHARLES M. CARPENTER, M.D.

Discussion: CAPUS WAYNICK.

Health Education in Hospitals and Out-Patient Departments. HENRIETTA STRAUSS.

WEDNESDAY, 4:45 P.M.

PUBLIC HEALTH NURSING

Second Session—Conference Room 2

Section Business.

THURSDAY, 9:30 A.M.

ENGINEERING

Second Session—Roof Garden South

TOOLS FROM THE WAR—PROMISED

Some Post-war Uses for DDT. W. E. DOVE.

Antu for Post-war Rodent Control. CURT P. RICHTER.

Experiences in the Construction and Maintenance of Army Water Supplies in Foreign Areas. MAJOR F. D. STEWART, SN.C., and CAPTAIN J. B. BATY, SN.C.

Lessons Learned from the Internal Security Program. LIEUTENANT COLONEL WILLIAM H. WEIR, SN.C.

Controls for a Dengue Epidemic in Hawaii. WESLEY GILBERTSON.

Discussion: E. J. HERRINGER.

THURSDAY, 9:30 A.M.

LABORATORY

Fourth Session—Roof Garden North

A SERIES OF ABRIDGED PAPERS DEALING WITH WATER, MILK AND RELATED PROBLEMS

Discussion of Culture Media for Use in the Performance of Sterility Tests. C. W. CHRISTENSEN, PH.D.

A Semi-Synthetic Medium for Use in Disinfectant Testing. PAUL A. WOLF, PH.D.

Studies in Connection with the Selection of a Satisfactory Culture Medium for Bacterial Air Sampling. ROY SCHNEITER, PH.D., JOHN E. DUNN, M.D., and BARBARA H. CAMINITA.

Water Purification by Flotation. SAMUEL H. HOPPER, PH.D.

A Simplified Bacteriological Examination of Water. CHARLES A. HUNTER, PH.D., ELEANOR PATTY and FLORA A. MCKINLEY.

The Influence of Alkaline Pipe Cleaners on the Bacterial Flora of Cesspools and Its Effect on Septic Tanks. NICHOLAS M. MOLNAR.

The Application of Phosphatase Tests to Cheese. H. SCHARER.

The Bacterial Count, an Accurate Estimate Capable of Accurate Interpretation. ROBERT S. BREED, PH.D., and JAMES D. BREW, PH.D.

The Significance of Coliform Organisms in Milk. WALTER L. MALLMANN, PH.D.

Effect of Temperature on the Multiplication of Coliform Organisms in Milk and Cream. ELIZABETH F. GENUNG and ELIZABETH ROBINTON.

The Effect of Time, Temperature and Culture Medium on the Total Count in the Examination of Fine Ground Gelatin. MURRAY P. HORWOOD, PH.D.

SCHOOL HEALTH, MATERNAL AND CHILD HEALTH, AND FOOD AND NUTRITION SECTIONS

Joint Session—Madhattan Room

Presiding: LEONA BAUMGARTNER, M.D., MYRON E. WEGMAN, M.D., and DONALD K. TRESSLER, PH.D.

GROWTH AND DEVELOPMENT

A Review of the Evidence as to the Nutritional State of Children in France. HAROLD C. STUART, M.D.

Nutrition and Its Relationship to Complications of Pregnancy and Survival of the Infant. BERTHA S. BURKE.

Implications of Nutrition in the School Health Program. ICIE MACY HOOBLER, PH.D.

The Influence of Psychological Factors on the Nutrition of Children. MILTON J. E. SENN, M.D.

THURSDAY, 9:30 A.M.

INDUSTRIAL HYGIENE, PUBLIC HEALTH EDUCATION, AND PUBLIC HEALTH NURSING SECTIONS

Joint Session—Salle Moderne

Presiding: HERBERT G. DYKTOR, MAYHEW DERRYBERRY, PH.D., and MARION H. DOUGLAS R.N.

A DEMONSTRATION OF COÖPERATIVE EFFORT FOR HEALTH EDUCATION OF WORKERS ON THE JOB

The Plan of the Fort Greene Industrial Health Committee. JACOB H LANDES, M.D.

Organized Labor's Coöperation in the Plan. LOUIS HOLLANDER.

Management's Coöperation in the Plan. L. HOLLAND WHITNEY, M.D.

Community Coöperation. KENNETH D. WIDDEMER.

Organized Medicine's Coöperation. CHARLES F. MCCARTY, M.D.

Rôle of the National Voluntary Agency. PHILLIP R. MATHER.

Discussion: LEVERETT D. BRISTOL, M.D., VICTOR G. HEISER, M.D., and MARY E. DELEHANTY, R.N.

HEALTH OFFICERS, VITAL STATISTICS, AND EPIDEMIOLOGY SECTIONS

Joint Session—Georgian Room

Presiding: JOSEPH H. KINNAMAN, M.D., SELWYN D. COLLINS, PH.D., and LIEUTENANT COLONEL GAYLORD W. ANDERSON, M.C.

THE EFFECT OF WAR ON TUBERCULOSIS

World War I and Tuberculosis. G. J. DROLET.

Discussion.

Tuberculosis in England and Other Countries at War. JAMES A. DOULL, M.D.

Current Tuberculosis Statistics in the United States. MARY DEMPSEY.

Discussion: J. T. MARSHALL.

Tuberculosis in the Armed Forces. COLONEL ESMOND R. LONG, M.C.

Small Film Radiography Among Industrial Groups. HERMAN E. HILLEBOE, M.D.

Discussion: ROBERT E. PLUNKETT, M.D.

THURSDAY, 9:30 A.M.

DENTAL HEALTH

Second Session—Parlor 2

A SYMPOSIUM ON VINCENT'S INFECTION—A WARTIME DISEASE

Some Epidemiological Aspects of the Disease. H. TRENDLEY DEAN, D.D.S., and D. E. SINGLLTON, JR., D.D.S.

Observations on the Oral Spirochetal Flora Present in Vincent's Infections. E. G. HAMPP, D.D.S.

Treatment of the Disease. HAROLD J. LEONARD, D.D.S.

Reporting of the Disease. C. L. SEBELIUS, D.D.S.

THURSDAY, 12:30 P.M.

SECOND GENERAL SESSION

Luncheon Session—Ball Room

Presiding: FELIX J. UNDERWOOD, M.D., *President,* American Public Health Association.

Announcement of New Officers, Resolutions.

Presentation of Forty Year Membership Certificates.

Recognition of National Health Honor Roll Health Officers.

THURSDAY, 2:30 P.M.

HEALTH OFFICERS, LABORATORY, AND EPIDEMIOLOGY SECTIONS

Joint Session—Salle Moderne

Presiding: JOSEPH H. KINNAMAN, M.D., LIEUTENANT COLONEL GAYLORD W. ANDERSON, M.C., and C. A. PERRY, SC.D.

WAR AND COMMUNICABLE DISEASES

Health Problems Under Military Government. BRIGADIER GENERAL JAMES S. SIMMONS, COLONEL THOMAS B. TURNER, M.C., and COLONEL IRA V. HISCOCK, SN.C.

Mite Typhus in Southwest Pacific Area. KENNETH F. MAXCY, M.D.

Problems of Filariasis. HAROLD W. BROWN, M.D.

The Rôle of Hemolytic Streptococci in Respiratory Diseases. CAPTAIN ELIAS STRAUSS, M.C.

Public Health in the Tropics. GUILLERMO ARBONA, M.D., and PABLO MORALES OTERO, M.D.

Successful Treatment of Experimental Western Equine Encephalomyelitis with Hyperimmune Rabbit Serum. JOSEPH ZICHIS, PH.D., and HOWARD J. SHAUGHNESSY, PH.D.

THURSDAY, 2:30 P.M.

THIRD SPECIAL SESSION

Georgian Room

Presiding: REGINALD M. ATWATER, M.D.

LANDMARKS OF 1944

Association Progress in 1944. ABEL WOLMAN, DR.ENG.

Next Steps in Appraising Local Health Work. WILTON L. HALVERSON, M.D.

Local Health Service—A New Approach to an Old Problem. HAVEN EMERSON, M.D.

Career Service in Public Health. WILLIAM P. SHEPARD, M.D.

New Information on Communicable Disease Control. JAMES P. LEAKE, M.D.

Medical Care and the Health Officer. HUGH R. LEAVELL, M.D.

Housing and Public Health. C.-E. A. WINSLOW, DR P.H.

Association Impacts—Past and Present. LOUIS I. DUBLIN, PH.D.

PUBLIC HEALTH EDUCATION

Third Session—Roof Garden North

Presiding: MAYHEW DERRYBERRY, PH.D., *Chairman.*

Section Business.

Report of the Committee on Post-War Planning in Health Education. *Chairman,* HUGH R. LEAVELL, M.D.

Report of the Committee on Health Education in Latin America. *Chairman,* CHARLES E. SHEPARD, M.D.

Report of the Committee on Utilization of Commercial Advertising for Health Education. *Acting Chairman,* DAVID RESNICK.

Report of the Committee on Problems in Cost Accounting for Health Education. *Chairman,* HARRY E. KLEINSCHMIDT, M.D.

Report of the Committee on Relationship of Community Health Education to School Health Education. *Chairman,* REBA F. HARRIS.

A Program on Health Films. ADOLF NICHTENHAUSER, M.D.

THURSDAY, 2:30 P.M.

FOOD AND NUTRITION

Second Session—Madhattan Room

THE NUTRITIVE VALUE OF THE AMERICAN WARTIME DIET

The Nutritive Value of the American Wartime Diet. FRANK G. BOUDREAU, M.D.

Biological Values of Food Proteins in Relation to the Essential Amino Acids. JOHN R. MURLIN, PH.D.

The Effect of Food Rationing on the Quality of Protein in the American Diet. RICHARD J. BLOCK, PH.D.

Food Uses for Soybeans and Soybean Products. DONALD S. PAYNE.

Food and Drug Adulteration in Wartime. W. R. M. WHARTON

SCHOOL HEALTH SECTION, AMERICAN SCHOOL HEALTH ASSOCIATION, AND AMERICAN SOCIETY FOR RESEARCH IN PSYCHOSOMATIC PROBLEMS

Joint Session—Roof Garden South

Presiding: LEONA BAUMGARTNER, M.D., C. L. OUTLAND, M.D., and LAWRENCE K. FRANK, PH.D.

A SYMPOSIUM ON PHYSICAL FITNESS AND HEALTH PROBLEMS OF THE ADOLESCENT

Physiological and Emotional Problems of Adolescence. LAWRENCE K. FRANK, PH.D.

Health Service in a High School. What It Can Offer. WILLIAM SCHMIDT, M.D.

Discussion: COLONEL LEONARD ROWNTREE.

Presentation of Case Material. J. ROSWELL GALLAGHER, M.D.

Discussion: NORMAN MOORE, M.D.

EMPLOYMENT SERVICE

The Association Employment Service seeks to bring to the attention of appointing officers the names of qualified public health personnel and to act as a clearinghouse on employment. This is a service of the Association conducted without expense to the employer or employee.

From the registry of persons available, selected announcements are published from time to time. Appointing officers may obtain lists of all registrants on request.

Address all correspondence to the Employment Service, American Public Health Association, 1790 Broadway, New York 19, N. Y.

POSITIONS AVAILABLE

STATE OF WASHINGTON DEPARTMENT OF HEALTH ANNOUNCES THE FOLLOWING OPENINGS

Physician as obstetric consultant in Washington State Department of Health. Preferably with 3 years' special residency in obstetrics and gynecology. Salary $5,280 to $6,000 per annum.

Sanitarian. Preferably with public health training and experience. Salary $2,290 to $2,640.

Bacteriologist to take complete charge of local health laboratory. Requirements include college graduation with major in bacteriology and at least one year of employment in a public health laboratory. Salary $190 to $220 per month.

Physician as health officer in county health department in Northwest. Previous public health experience preferable. Entrance salary $440 per month. Permanent position.

Address Lee Powers, M.D., State Director of Health, 1412 Smith Tower, Seattle, Wash.

Wanted: A physician trained in tuberculosis to assume administrative control of the Bureau of Tuberculosis in an eastern city of 200,000 population. Salary $4,500–$5,031 plus cost of living adjustment. Address **Box B,** Employment Service, A.P.H.A.

Wanted: A physician with venereal disease control experience to assume directorship of the Bureau of Venereal Diseases in a large northeastern city. Salary $4,500–$5,000 per year, plus cost of living adjustment and travel allowance. **Box E,** Employment Service, A.P.H.A.

St. Louis, Mo., Health Division, Industrial Hygiene Service, seeks two industrial hygienists, either engineers or chemists. Salaries $225 to $250 per month depending on qualifications and experience, plus travel allowances. Address Robert M. Brown, Public Health Engineer, 64 Municipal Courts Bldg., St. Louis 3, Mo.

Wanted: Medical technologists for 550 bed approved California hospital. Give full particulars and state salary desired. Address W. O. Brown, M.D., Kern General Hospital, Bakersfield, Calif.

Public Health Nurses Wanted: Three staff positions available. Generalized program. Annual salary $2,220 to $2,400 plus travel for use of own car. Address Miss Lorilla Britell, Supervisor, King County Health Dept., County-City Building, Seattle 4, Wash.

Health Department of Southern City and County in a rapidly expanding industrial area, population exceeding 200,000, wishes to employ a Director of Division of Preventable Diseases. Salary commensurate with training and experience, $4,100–$4,700 plus allowance for travel. Write **Box P,** Employment Service, A.P.H.A.

Wanted: Bacteriologist or serologist, junior grade, with public health experience preferred, to work in County Laboratory acting in capacity of a State Branch Laboratory. Permanent position, salary $168 per month with advancement if satisfactory. Apply to Dr. R. G. Beachley, Director of Health and Welfare, Arlington County Health Department, 1800 N. Edison St., Arlington, Va.

Bacteriologist Wanted with minimum of master's degree in bacteriology and one year's experience in an approved public health laboratory. Woman or draft exempt man, to take charge of newly established, newly equipped laboratory. Must be able to carry out all the usual procedures of a public health laboratory. Write full details including minimum starting salary requirement. All letters including vitae and photo will be promptly acknowledged. Address E. E. Palmquist, M.D., King County Health Department, 402-L County-City Building, Seattle 4, Wash.

Wanted: A Vital Statistician to assume directorship of the Bureau of Vital Statistics in a large northeastern city.

Salary $2,500–$3,100, plus cost of living adjustment. Write **Box G**, Employment Service, A.P.H.A.

Wanted: County Public Health Nurse for midwestern state. Present salary $160 per month and travel allowance. Must have had previous experience in public health. Own and drive car. Address District Health Unit 2, West Branch, Mich.

Physician—public health pediatrics. To assist director of maternal and child health in a large California County Health Department. Major duties, conducting of infant and preschool health conferences and school examinations. Beginning salary $390 a month and travel allowance. California license required. Training and experience in pediatrics or public health or both. Immediately available. Address William C. Buss, M.D., Kern County Health Dept., Bakersfield, Calif.

Wanted: Physician with tuberculosis training to direct Tuberculosis Division of Milwaukee Health Dept. Salary $4,200 per year plus cost of living wage adjustment. If interested contact Dr. G. F. Burgardt, Milwaukee Health Dept., Milwaukee, Wis.

Southern Wisconsin county announces position now open for supervising public health nurse. Office is located in city containing state capitol and university. Staff consists of two nurses. Requirements are degree of bachelor of science in public health nursing, 2 or 3 years' experience as staff nurse, some experience as supervising nurse. Must be eligible for certification as public health nurse in Wisconsin. Beginning salary $185. Write **Box Z**, Employment Service, A.P.H.A.

Wanted: Physician in eastern city of 190,000 population as Director of Bureau of Maternal & Child Hygiene. Salary $4,500–$5,031 plus cost of living adjustment. **Box U**, Employment Service, A.P.H.A.

Wanted: Two full-time public health nurses. Salary to start $165 plus $15 War Bonus per month. Car mileage paid at rate of 5¢ per mile. Write **Box Q**, Employment Service, A.P.H.A.

Wanted: Superintendent and Medical Director for tuberculosis sanatorium having 65 bed capacity and average of 35 patients per day. Salary $4,380 with $300 annual allowance for car. Write M. P. Hunter, City Manager, Roanoke, Va.

Wanted: Industrial hygienist to conduct surveys of industrial plants for large insurance company with complete laboratory facilities and field testing equipment. This is an excellent opportunity for a permanent, not a war period, position. State age, family status, education, experience, qualifications, and minimum salary. Write **Box O**, Employment Service, A.P.H.A.

Public Health Nurse, supervisory work in orthopedics, must have certificate in public health. Salary $2,050 with maintenance of car, meals and upkeep while in the field. Address Dr. R. G. Beachley, Director of Health & Welfare, Arlington Co. Health Dept., 1800 N. Edison St., Arlington, Va.

Wanted: Staff nurses for 200 bed municipal tuberculosis hospital. Salary $190 per month, $35 per month deduction if maintenance desired. Educational program with opportunity for post-graduate work with University credit planned. For full information write Superintendent of Nurses, Firland Sanatorium, Richmond Highlands, Wash.

Wanted: Health officer for County-City health unit. Good opportunity for right man. Salary to start $4,500 per year and travel expenses. Position permanent. Address G. F. Campana, M.D., Acting State Health Officer, Bismarck, N. D.

Wanted: Bacteriologist to direct and operate a modern public health laboratory in southeastern city of 70,000 population. Examinations 1,500 to 2,000 a month, largely serological and milk tests. Salary available to start $2,400 per annum increasing to $2,700 for satisfactory service. Assistant bacteriologist also needed, with available salary of $1,800 increasing to $2,000 if satisfactory service is shown. Write **Box N**, Employment Service, A.P.H.A.

Wanted: School dentist to direct and operate school dental program in southeastern city of 70,000 population. Salary available starting at $3,600 and increasing to $4,000 for satisfactory service. For further particulars write **Box Y**, Employment Service, A.P.H.A.

Wanted: An assistant in Health Division Council of Social Agencies, interested in community organization and health education. Large city and metropolitan area. State age, training and experience. Write **Box X**, Employment Service, A.P.H.A.

Wanted: Health Educator, preferably unmarried man with experience in venereal disease control. Work chiefly in suburban areas. Some evening work. Good salary with very generous travel allowance. Position under Civil Service with annual increases in salary. Address Venereal Disease Division, Wayne County Health Dept., 5716 Schaefer Rd., Dearborn, Mich.

Wanted: Public health nurse for staff work on a generalized program. Private agency, 45 hour week. Location 30 miles from New York City. Salary first year, $1,859.54; second year, $2,009.54; maximum salary $2,217.60. Transportation supplied, 24 working days' vacation annually. Write **Box V**, Employment Service, A.P.H.A.

Wanted: Director of Maternal and Child Health for Santa Barbara County Health Department. Salary $4,500 per year, all expenses furnished. Write Dr. L. C. Newton Wayland, Santa Barbara Co. Health Dept., Santa Barbara, Calif.

FOR OTHER POSITIONS AVAILABLE WRITE EMPLOYMENT SERVICE, AMERICAN PUBLIC HEALTH ASSOCIATION, 1790 BROADWAY, NEW YORK 19, N. Y.

In view of the current active demand for trained and experienced persons in public health, it is suggested that prospective employers communicate directly with the Employment Service, American Public Health Association, 1790 Broadway, New York 19, N. Y., for up-to-date lists of applicants.

POSITIONS WANTED

ENGINEER

Well qualified public health engineer seeks responsible position in New York metropolitan area. **E-480**

Sanitary Engineer, C.E. 22 years' experience as sanitary engineer, 14 as director in state health department, now employed. Desires change. Location immaterial. **E-481**

LABORATORY

Research bacteriologist - veterinarian, now in civil service, desires change to direct or indirect war work. P-3 classification. Considerable laboratory and field experience. Used to foreign travel; will go anywhere. Steady hard worker. **L-470**

Bacteriologist, 29, draft exempt, 3 years' experience public health laboratory, 2 years' experience industrial organization. Experienced in investigation and control activities on water, sewage, and sanitation as chemist, bacteriologist and serologist in syphilis and enteric diseases. **L-465**

Bacteriologist-Serologist, male, with 20 years' experience in state and municipal public health laboratories, last 10 years in administrative capacity, now in charge of a midwest diagnostic laboratory, wishes to make a permanent change. **L-427**

HEALTH EDUCATION

Woman with background of nursing administration and health education seeks position in health education field. **H-509**

STATISTICS

Woman with background of statistics and epidemiology involving administration seeks position in statistical administration. Salary $3,500 or over. **S-460**

MISCELLANEOUS

Sanitarian-Veterinarian, age 23, seeks employment in public health field. Experienced as veterinarian, serologist, sanitary inspection. **M-460**

NEWS FROM THE FIELD

U. S. ARMY DEVELOPS CIVIL PUBLIC HEALTH DIVISION

It has been announced that the Office of The Surgeon General, U. S. Army, Washington, has added a Civil Public Health Division under the Preventive Medicine Service. Warren F. Draper, M.D., Deputy Surgeon General, U. S. Public Health Service, has been appointed Chief of the Public Health branch of the Civil Affairs Section at the supreme headquarters of the Allied Expeditionary Force and will serve the Army with the rank of Brigadier General.

According to the announcement, the purpose of the new division is to develop plans pertaining to public health policy and practice in occupied and liberated territories. The division is directed by Colonel Thomas B. Turner who has recently made a tour of European and Mediterranean theaters of operation. Colonel Turner formerly was Director of the Venereal Disease Control Division, and is on leave as Professor of Bacteriology at the Johns Hopkins University School of Hygiene and Public Health.

The Allied Armies, according to the announcement, will be called upon to assume a measure of responsibility for civilian public health in many areas, entailing supervision of or liaison with local public health officials and the provision of certain necessary medical supplies. To accomplish its objective the Army plans to commission from civil life a number of officers experienced in public health administration and in specialties such as epidemiology, nutrition, and maternal and child hygiene. Candidates should be under 50 years of age and be qualified physically to perform at least limited service duties overseas. Men selected will undergo a course of training at the School of Military Government, Charlottesville, Va., and at the Civil Affairs Training School, Yale University.

Instruction will include the theory and general principles of military government and liaison and the language and background of certain Far Eastern areas. Provision will also be made for training men in special phases of public health and certain medical specialties. Further information may be obtained by addressing the Surgeon General of the U. S. Army, Washington 25, D. C., attention Civil Public Health Division.

ONTARIO CANCER CONTROL FOUNDATION

According to the *Journal of the American Medical Association,* a Cancer Control Foundation for Ontario has been established through a legislative appropriation of $500,000. The Foundation has been empowered to acquire lands and buildings and to employ a director, officers, and the necessary clerical staff. Lt. Col. A. L. Bishop, Toronto, is Chairman of the Foundation.

FEDERAL SERVICES REQUIRE SANITARY ENGINEERS

On July 15, 1944, a procurement objective for 211 sanitary engineers for the Sanitary Corps, U. S. Army, was announced by the Chief, Procurement Division, Army Service Forces, Washington, D. C. At the same time the U. S. Public Health Service made known a need for 100 additional sanitary engineers.

Sanitary engineers are urged to get in touch with their State Advisers, Pro-

curement and Assignment Service, in each state, for additional information concerning the needs and opportunities for service. These State Advisers will determine those sanitary engineers essential for protection of civilian public health, and will issue certificates of availability to those who can be released for service.

The U. S. Public Health Service has recently assigned a Commissioned Officer, E. S. Tisdale, Sanitary Engineer, to head the Procurement and Assignment Service for Sanitary Engineers, War Manpower Commission, at 1778 Pennsylvania Avenue, N.W., Washington, D. C. Captain David Smallhorst who replaced Captain Klassen in the past, has been transferred to other duties with the Sanitary Corps, Army of the United States.

RECRUITMENT OF NURSES PASSES QUOTA

The National Nursing Council for War Service, New York, recently announced that the quota of 65,000 new student nurses set for the year ending in July had been exceeded by more than 500 enrollments. Gains during the last 6 months were due, according to the announcement, to the momentum gained by recruitment for the U. S. Cadet Nurse Corps, undertaken jointly by the U. S. Public Health Service and the Council, and the integrated efforts of the recruitment committees of state and local councils for war service.

According to Lucile Petry, Director of the Cadet Nurse Corps, renewed efforts will be necessary during the coming school year to increase the housing facilities of schools of nursing in order to accommodate 60,000 new students, the quota for 1944–1945, to provide instructional personnel, and to increase further the number of affiliations necessary for adequate clinical training. She points out that hospitals were running as much as 35 per cent ahead of last year in number of patients and that the Army Nurse Corps had set a new ceiling of 50,000 nurses for the year 1945. The need for student nurses, she said, was still urgent.

AMERICAN HOSPITAL ASSOCIATION TO STUDY NATIONAL HOSPITAL RESOURCES

The American Hospital Association, Chicago, has announced the appointment of Dr. Thomas S. Gates, President of the University of Pennsylvania, Philadelphia, as Chairman of the Commission on Hospital Care of the Association which has been set up to make a thorough study of present hospital resources and to provide a survey upon which to base future expansion and distribution of facilities. The American Hospital Association has undertaken this study as an effort in post-war planning and in the belief that careful research in the present resources will permit an estimate of future expansion and will assist in extending hospital facilities to each member of the community. The study is being financed in the amount of $105,000 by the Kellogg Foundation, the Commonwealth Fund, and the National Foundation for Infantile Paralysis, covering a 2 year program. Nationally known industrial, labor, education, political, and agricultural leaders will complete the 20 member commission.

ILLINOIS STATE-WIDE PUBLIC HEALTH COMMITTEE

Governor Dwight H. Green of Illinois recently appointed Benjamin Wham of Winnetka, Ill., to succeed Frederick Woodward who has resigned as Chairman of the Illinois State-wide Public Health Committee, an organization of some 4,000 citizens interested in the development of more adequate local public health services throughout the state. Mr. Wham, senior partner of the law firm of Wham, Rose & O'Brien,

in Chicago, is a past president of the Illinois State Bar Association, vice-president of the Chicago Crime Commission, a member of the House of Delegates of the American Bar Association, and a leading participant in numerous civic activities. He has taken an active interest in the work of the Illinois State-wide Public Health Committee since its creation in June, 1942.

The committee was organized as a result of the Illinois public health survey made in 1942 by the American Public Health Association, at the request of Dr. Roland R. Cross, State Director of Public Health, and with the approval of Governor Dwight H. Green. Under the chairmanship of Mr. Woodward, and co-chairmanship of Mrs. Guy A. Tawney of Urbana, it pushed the passage by the state legislature in 1943 of the Searcy-Clabaugh law which now empowers interested Illinois counties to establish and maintain full-time local public health departments. Several county affiliates of the state-wide committee have since been conducting educational campaigns for the establishment of such official local health departments under the new law. The state-wide committee has rendered assistance in these local projects through its Executive Secretary, Mrs. Fred P. Cowdin of Springfield. Mrs. Cowdin and Mrs. Tawney will continue to serve the committee.

NEW YORK CITY BOARD OF HEALTH RELAXES COMMUNICABLE DISEASE RESTRICTIONS

On July 11 the New York City Board of Health amended the Sanitary Code for the city relating to isolation of persons affected with meningococcus meningitis and poliomyelitis. According to Commissioner of Health Ernest L. Stebbins, M.D., this action was taken in order to conform with modern public health procedures. In both of these conditions isolation has been required for 14 days. It will from now on be required until the temperature has reached normal. The Board of Health also removed restrictions which required exclusion of contacts to these diseases from school or work.

These amendments as adopted by the New York City Board of Health parallel the action taken at the recent meeting of the Public Health Council of the New York State Department of Health and are in line with the recommendations of the joint Technical Advisory Committee for the Care of Patients with Anterior Poliomyelitis for the two departments.

According to Dr. Stebbins, in the case of meningococcus meningitis, treatment with sulfa drugs and penicillin has shortened to a marked extent the time of recovery. The organisms disappear very quickly when prompt and adequate chemotherapy has been administered. In the case of poliomyelitis, public health authorities have considered that the length of the isolation period may be safely limited to the period when temperature is above normal.

The statement of the advisory group on poliomyelitis of the New York State Department of Health and the New York City Department of Health is appended.

STATEMENT OF THE ADVISORY GROUP ON POLIOMYELITIS TO THE NEW YORK STATE DEPARTMENT OF HEALTH AND THE NEW YORK CITY DEPARTMENT OF HEALTH

At a meeting held on June 7, the Advisory Group carefully reviewed all available evidence and agreed unanimously to the following:

1. That all patients in whom a diagnosis of anterior poliomyelitis is suspected should be cared for in a hospital and that these patients may be safely admitted to the general wards but that it might be desirable to separate the patients in special wards for ease in handling.

2. That it be recommended to the Public Health Council of New York State and the Board of Health of New York City that quarantine procedures in hospitals be elimi-

nated but that concurrent disinfection of all excretions be continued.

3. That all patients should be treated whenever possible under the combined supervision of the pediatrician, orthopedic surgeon and specialist in physical medicine, and that during the acute stage the patient should be kept at complete rest and disturbed as little as possible; that during the acute stage the therapeutic value of hot moist packs (or if not available, other methods of applying heat) is recognized as a great value for the general comfort of the patient in the elimination of pain and soreness where they occur, whether these occur at rest or on movement; that splints should not be used in the acute stage of the disease except in specific instances as determined by an orthopedic surgeon.

4. A complete physical examination should be made to determine the residual muscle weakness or paralysis as soon as the patient's general condition and local muscle pain or soreness has subsided. If muscle weakness or paralysis is present, reëxamination is indicated at intervals of one to two weeks depending upon the severity. If there is no impairment in muscle strength within two weeks after onset, gradual increase in the patient's activity may be permitted under careful supervision. One month after discharge from the hospital the absence of muscle weakness should be verified by reëxamination. The after-care of patients with muscle weakness or paralysis should be determined after joint observation by the specialists concerned.

The members of the Advisory Committee include:

Dr. Edward S. Godfrey, Commissioner of Health, New York State Department of Health

Dr. Ernest L. Stebbins, Commissioner of Health, New York City Department of Health

Dr. Philip Duncan Wilson, Chief Orthopedist, Hospital for Special Surgery

Dr. William Benham Snow, Columbia University

Dr. James L. Wilson, Children's Service, Bellevue Hospital

Dr. Tracy J. Putnam, Chief, Neurological Institute, Columbia University

Dr. R. Plato Schwartz, University of Rochester

Dr. Kristian G. Hansson, Chief of Physiotherapy, Hospital for Special Surgery

Dr. Alan deForest Smith, Surgeon-in-Chief, New York Orthopedic Hospital

LONG ISLAND COLLEGE OF MEDICINE OFFERS POSTGRADUATE COURSE IN INDUSTRIAL MEDICINE

Dr. Jean A. Curran, President and Dean of the Long Island College of Medicine, Brooklyn, N. Y., announces the presentation by the College of its Third Postgraduate Course in Industrial Medicine. This course will be given under the auspices of the Department of Preventive Medicine and Community Health during the 3 week period October 16 to November 3, 1944, and will be conducted by more than fifty leading physicians in industrial practice, authorities in allied fields and members of the faculty of the College. The main objective of the course is to provide physicians engaged in full-time or part-time industrial practice, as well as those who wish to enter this field, an opportunity to orient themselves more fully to modern procedures in the rapidly developing specialty of industrial medicine. The two previous courses in this field given by the college in the fall of 1942 and 1943 were presented as a wartime service to industry at a time when expanding production required increasing numbers of qualified physicians for industrial practice. The course this year will place particular emphasis upon post-war conditions and problems associated with the return of workers from military service. Although designed for graduate physicians, the course will be open to industrial executives, personnel workers, industrial nurses, hygienists, engineers, and to others interested in industrial health.

The program of the course has been planned by the Industrial Medicine Advisory Committee of the college, of which Dr. John J. Wittmer, Medical and Personnel Director of the Consolidated Edison Company, is chairman.

The presentation of the course will include afternoon and evening lectures and seminars at the college,

supplemented by morning clinics and demonstrations arranged in coöperating hospitals and industrial medical departments. Segments of the course will be devoted to Medical Administration in Industry, Industrial Aspects of Internal Medicine, Industrial Surgery, Occupational Diseases and Personal Relations in Industry. A unique feature of the course is the emphasis which will be given to the medical aspects of personnel problems. Lectures presented during the course will provide the basis for the *Long Island College of Medicine Yearbook of Industrial Medicine.*

Enrollment in the course will be limited to 60 full-time students and a tuition fee of $60 will be charged for the entire 3 week course. A limited number of applicants particularly interested in specific phases of industrial medicine or with special qualifications will be accepted for admission on a part-time basis. A detailed schedule of lectures and seminars is being prepared by the college and will be available early in September. All inquiries concerning the course should be addressed to Dr. Thomas D. Dublin, Department of Preventive Medicine and Community Health, 248 Baltic Street, Brooklyn 2, N. Y.

BRITISH BIRTHDAY HONORS

According to *Science,* the King of England's Birthday Honors list includes Knighthood conferred upon Dr. Alexander Fleming, Professor of Bacteriology at the University of London, and on Dr. H. W. Florey, Professor of Pathology at the University of Oxford, in recognition of their work on penicillin. Also Knighthood on Dr. Percival Hartley, Director of Biological Standards in the British National Institute for Medical Research.

TOXIC DUSTS AND GASES

The American Standards Association announces the approval of a new standard on Allowable Concentration of Formaldehyde—Z37.16–1944, prepared by the A.S.A. Committee on Allowable Concentrations of Toxic Dusts and Gases. The American Public Health Association is represented on this committee by J. J. Bloomfield of Bethesda, Md. Copies of the standard may be obtained from the American Standards Association, 29 West 39th Street, New York, at 20 cents each.

NEW OFFICERS OF MISSOURI PUBLIC HEALTH ASSOCIATION

The new officers elected at the recent Annual Meeting of the Missouri Public Health Association are as follows:

President—Joseph C. Willette, D.V.M., St. Louis
President-Elect—William J. Dixon, Kansas City
First Vice-President—Ina Collins, R.N., Webb City
Second Vice-President—D. A. Campbell, M.D., Neosho
Treasurer—M. L. Gentry, M.D., Jefferson City
Secretary—J. Warren Smith, Jefferson City
Representative to A.P.H.A. Governing Council—W. Scott Johnson, Jefferson City

UNITED STATES-MEXICO BORDER PUBLIC HEALTH ASSOCIATION

The United States-Mexico Border Public Health Association met in El Paso and Ciudad Juarez recently and had 196 persons in attendance. A scientific program concerning the health of states and provinces on the Mexico-United States border was presented.

The following officers were elected:

President—Dr. Federico Ortiz Armengol, State Health Officer, Chihuahua
President-elect—Victor M. Ehlers, Texas State Department of Health
Vice-President—Dr. Victor Ocampo Alonzo, State Health Officer, Sonora
Vice-President—Dr. Donald Davy, California State Department of Public Health
Assistant Secretary—Dr. Adolfo Baz Dresch, Public Welfare Services, Ciudad Juarez

PERSONALS

Central States

JOHN WILLIAM HERR, M.D., of Millhousen, Ind., has been appointed Health Commissioner of Posey County.

CHAUNCEY A. HYATT,* Chicago, Ill., Swimming Pool Sanitarian, resigned July 1, from the staff of the State Department of Public Health.

EDWIN M. IRELAND, M.D., has been appointed Health Officer of Pratt County, Kan., to succeed Ernest J. Beckner, M.D.†

THURMAN R. LAUGHBAUM, M.D.,† P. A. Surgeon, U. S. Public Health Service, has been appointed Health Officer of Geary County, Kan.

Eastern States

EDWARD M. BANGASSER, M.D., Buffalo, N. Y., has been appointed Health Officer of Lancaster, N. Y., to succeed CLARENCE B. MACKEY, M.D.

JAMES C. BOLAND, M.D.,† Binghamton, N. Y., has been appointed Health Officer of Troy.

DAVID E. FRASER, M.D., has been appointed Health Officer of Lyndonville, N. Y.

HENRY C. LAPP, M.D., has resigned as Health Officer of North Tonawanda, N. Y., a position he had held for twenty-two years. He was a member of the Board of Health for twenty-five years.

Southern States

CHARLES ARMSTRONG, M.D., Sc.D.,* of the National Institute of Health, Bethesda, Md., was among those elected to the National Academy of Sciences. Dr. Armstrong recently received the Sedgwick Memorial Medal for distinguished service in public health.

ABRAM J. DAVIS, M.D.,† Swainsboro, Ga., has resigned as Health Commissioner of Emanuel County to accept a similar position in Richmond County.

CHARLES L. RIDLEY, M.D., Macon, Ga., Health Officer of Bibb County, has been appointed Chairman of the State Department of Public Health, Atlanta, Ga.

PAUL W. SHIPLEY † recently resigned his position as Associate Public Health Representative and Chief of Tabulation and Analysis Section with the Louisiana State Department of Health, New Orleans, La., to accept a commission in the commissioned Corps of the U. S. Public Health Service as Assistant Sanitarian (R), and has been assigned to the Mississippi State Board of Health, Division of Preventable Disease Control, Jackson, Miss., as Epidemiological Sanitarian.

DON E. WILDER, M.D., Grayson, Ky., recently resigned as Health Officer of Carter County, Ky.

Western States

PERCY F. GUY, M.D.,† Seattle, Wash., has been appointed Assistant Health Officer of King County, Wash.

IVAN C. HALL, PH.D., formerly Professor and Head of the Department of Bacteriology and Public Health, University of Colorado School of Medicine at Denver, and for the past 2½ years Director of the Central Laboratory of the Contaminated Wound Project, Subcommittee on Surgical Infections, National Research Council, with headquarters at the College of Physicians and Surgeons, Columbia University in New York, N. Y., has been appointed Professor and Chairman of the Department of Bacteriology at New York Medical College, Flower and Fifth Avenue Hospitals, succeeding LAURA FLORENCE, M.D., who will retire in September.

* Fellow A.P.H.A.
† Member A.P.H.A.

WILLIS E. SMICK, M.D., has resigned as Deputy County Health Officer of Kittitas, Wash.

Foreign

J. M. MACKINTOSH, M.D.,† according to *Science,* has been appointed to the Chair of Public Health at the University of London, tenable at the London School of Hygiene and Tropical Medicine.

JOHN HARLAND PAUL, M.D., who has been in charge of malaria control work in Haiti, has accepted appointment as Director of the Bureau of Malaria Control of the Florida State Department of Health, Jacksonville.

GORDON CLIVE SMITH, M.D., has been appointed Medical Officer for Industrial Hygiene in the Department of Public Health at New South Wales.

SIR STANLEY WOODWARK, according to *Science,* has been appointed President of the Royal Institute of Public Health and Hygiene, London.

CONFERENCES AND DATES

American Association for the Advancement of Science—Annual Meeting and Annual Science Exhibition. Cleveland, Ohio. September 11–16.

American Congress of Physical Therapy—23rd Annual Scientific and Clinical Session. Hotel Statler, Cleveland, Ohio. September 6–9.

American Dietetic Association—27th Annual Meeting. Palmer House, Chicago, Ill. October 25–27.

American Education Week—November 5–11.

American Hospital Association. Cleveland, Ohio. October 2–6.

American Public Health Association—Second Wartime Public Health Conference and 73rd Annual Business Meeting. Hotel Pennsylvania, New York, N. Y. October 3–5.

American Public Welfare Association—Regional Conference. Cheyenne, Wyo. September 13–14.

American Public Works Association. St. Paul, Minn. September 24–27.

American Water Works Association—North Dakota Water and Sewage Works Conference—Grand Pacific Hotel, Bismarck, N. D. September 12–13.

Western Pennsylvania Section—Roosevelt Hotel, Pittsburgh, Pa. September 13–14.

Rocky Mountain Section—Cosmopolitan Hotel, Denver, Colo. September 21–22.

American Public Works Congress—St. Paul, Minn. September 24–27.

Southwest Section—Hotels Stephen F. Austin and Driskill, Austin, Tex. October 17–19.

Missouri Valley Section—President Hotel, Kansas City, Mo. October 23–24.

California Section—Biltmore Hotel, Los Angeles, Calif. October 24–26.

West Virginia Section—Chancellor Hotel, Parkersburg, W. Va. October 26–27.

New Jersey Section—Atlantic City, N. J. November 2–4.

Four States Section—Benjamin Franklin Hotel, Philadelphia, Pa. November 8–10.

Virginia Section—John Marshall Hotel, Richmond. November 14–15.

Florida Section—Suwanee Hotel, St. Petersburg, Fla. November 16–18.

Association of Military Surgeons of the United States. Hotel Pennsylvania, New York, N. Y. November 2–4.

Biological Photographic Association—14th Annual Meeting. Binghamton, N. Y. September 7–9.

Civil Service Assembly—Conference on Public Personnel Administration. Chicago, Ill. November 1–3.

Federation of Sewage Works Associations. William Penn Hotel, Pittsburgh, Pa. October 12–14.

International College of Surgeons—Ninth Annual Assembly. Benjamin Franklin Hotel, Philadelphia, Pa. October 3–5.

National Association of Sanitarians—8th Annual Conference. Hotel Hilton, Long Beach, Calif. September 17–19.

National Chemical Exposition—Sponsored by the Chicago Section of the American Chemical Society. The Coliseum, Chicago, Ill. November 15–19.

New England Industrial Nurses Association and Institute on Industrial Nursing—29th Annual Conference. Hotel Statler, Boston, Mass. October 13–15.

New York Institute of Clinical Oral Pathology. New York Academy of Medicine. Hosack Hall. October 30.

New York State Association of Milk Sanitarians—Annual Meeting. Hotel Syracuse, Syracuse, N. Y. September 20–22.

Pennsylvania Sewage Works Association—Seventeenth Annual Conference. William Penn Hotel, Pittsburgh, Pa. October 12–14.

American Journal of Public Health
and THE NATION'S HEALTH

Volume 34 October, 1944 Number 10

Surveys of Nutrition of Populations*

4. The Vitamin D and Calcium Nutrition of a Rural Population in Middle Tennessee

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THIS report deals with the vitamin D and calcium nutrition of the population whose general character and nutrition in respect to certain other nutritive factors have been described in previous publications.

METHODS

Dietary—The diet intake record in respect to vitamin D and calcium was obtained as previously described.[1] For the calculation of calcium intake the tables of *A Laboratory Handbook for Dietetics*, by Mary Davies (Schwartz) Rose, *The Fundamentals of Nutrition*, by Hawley and Maurer-Mast, the *Farmers' Bulletin, Rabbit Raising*, U. S. Department of Agriculture, and *The Structure and Composition of Foods*, by Winton and Winton were used.[2] For vitamin D the tables used were by Booher, Hartzler, and Hewston, "A Compilation of the Vitamin Values of Foods in Relation to Processing and Other Variants."[3] In each instance the value most clearly applicable in respect to season, variety, preparation, etc., was selected. In the few instances where values were lacking in these tables other sources were used, or, if no satisfactory figures could be found, arbitrary values were assigned on the basis of similarity to other foods or on similar grounds. In no cases did such arbitrary assignment of values modify the results significantly.

History and Physical Examination—A medical history and a physical examination of every subject was obtained as described in a previous report. Unfortunately there are few symptoms and signs of either calcium or vitamin D deficiency except in relatively severe and advanced deficiency states. Also, except in very young children (generally under 3 years), the physical signs

* The studies referred to herein were conducted under the auspices of the International Health Division of the Rockefeller Foundation of New York City by the Nutrition Unit of the Departments of Medicine and Biochemistry of the Vanderbilt University School of Medicine, Nashville, Tenn.

of vitamin D deficiency (rickets) are those of healed rickets, the scars or residual deformity of rickets. In the history particular attention was paid to weakness, head sweating, skeletal deformities, disorders of growth and development which might possibly be attributed to rickets or calcium deficiency, and to a prior diagnosis of rickets, tetany, or osteomalacia. A record of frequent or excessive decay or disturbances in eruption and formation of the teeth in children under 16 was included. The intake of cod liver oil or other forms of vitamin D or calcium supplement was recorded.

Physical examination paid special attention to skeletal deformities, craniotabes, dental development and hygiene, and physical weakness possibly associated with rickets. Rachitic deformities in older children, representing old, inactive rickets, were recorded as a matter of interest concerning previous vitamin D nutrition. They were clearly distinguished from those deformities probably indicating active rickets. Physical signs of calcium deficiency included skeletal deformities, particularly of the thorax and pelvis, seen only in rather severe chronic deficiencies, and Chvostek's sign, Trousseau's sign and similar manifestations of tetany.

Laboratory — Laboratory tests and special procedures included the phosphatase, phosphorus, and calcium concentration in the blood and x-ray photographs of certain bones. The blood phosphatase was determined by the method of Bodansky [4] which includes a determination of the blood phosphorus. Concentration of calcium in the blood serum was determined by the Kramer-Tisdall [5] technic. Determination of the blood calcium was included despite the belief that low values, except for a rare calcium deficiency complicating rickets, would be very few, even if there were calcium deficiency. It seemed desirable to obtain such data for a general population in conjunction with a record of calcium intake.

The x-ray examinations included an anterior-posterior view of the hand, wrist, and lower forearm and a lateral view of the foot, ankle, and lower leg. Most of the examinations were made with the regular hospital apparatus and technics and, because the present report deals with only the usual clinical roentgenologic diagnosis of rickets, osteomalacia and demineralization (osteoporosis), the technic will not be described in detail. A few of the x-ray photographs were made with a mobile apparatus. The photographs were interpreted by one of the professional staff of the Department of Roentgenology.* In addition to the usual clinical interpretation, the density of bone as revealed in the x-ray photograph was measured by a densitometer using a photoelectric cell. This latter investigation however will be made the subject of a separate study and report.

RESULTS

In order to conserve space, tables of the dietary intake of vitamin D have been omitted because the unknown supply from ultra-violet light (sunlight) makes it difficult or impossible to determine the adequacy of the dietary portion. It is worth noting however that only 11 of 72 children 1–3 years of age were recorded as receiving as much as 100 International Units of vitamin D daily in their diets. The intake in the form of a medical supplement given to those subjects with symptoms, physical signs, or laboratory evidence of a deficiency is recorded in the discussion of those cases.

The intake of calcium according to age, sex, and race is shown in Table 1. Sixty-eight per cent of the white and 87

* We are greatly indebted to Dr. Herbert C. Francis, Associate Professor of Radiology for the roentgenographic diagnosis.

TABLE 1

Distribution of Calcium Intake Among Persons in the Survey According to Age, Sex and Race Together With the Number and Percentage of Subjects With Intake Below Recommended Allowances *

Calcium Intake Grams	Age in Years 1–3 M-F †	4–6 M-F	7–9 M-F	10–12 M-F	13–15 M	13–15 F	16–20 M	16–20 F	21+ M	21+ F	Total
					White						
0.10	0	0	0	0	0	0	0	0	0	0	0
0.10–0.19	1	2	3	1	1	2	1	1	1	13	26
0.20–0.29	4	3	4	2	1	2	1	2	7	29	55
0.30–0.39	3	10	9	12	1	1	0	6	13	36	91
0.40–0.49	5	3	7	7	2	6	3	3	29	23	88
0.50–0.59	8	4	3	4	1	3	5	3	17	22	70
0.60–0.69	1	2	4	2	0	0	4	4	21	24	62
0.70–0.79	4	5	3	3	2	2	3	1	19	15	57
0.80–0.89	3	4	4	5	0	0	0	0	16	12	44
0.90–0.99	6	1	8	3	1	1	4	3	15	12	54
1.00+	6	13	21	11	12	2	16	8	81	35	205
Unknown	0	1	0	1	0	0	3	2	9	8	24
Total	41	48	66	51	21	19	40	33	228	229	776
Recommended dietary allowances gm.	1	1	1	1.2	1.4	1.3	1.4	1.0	0.8	0.8	
Number known	41	47	66	50	21	19	37	31	219	221	752
Number with less than recommended allowance	35	34	45	44	14	19	27	23	107	162	510
Percentage with less than recommended allowance	85.4	72.3	68.2	88.0	66.7	100.0	73.0	74.2	48.8	73.0	67.8
					Colored						
0.10	4	0	0	0	0	0	0	0	1	1	6
0.10–0.19	4	6	3	3	1	0	0	2	3	11	33
0.20–0.29	6	5	4	2	1	3	0	3	10	17	51
0.30–0.39	4	2	9	6	1	3	0	3	20	11	59
0.40–0.49	5	6	1	6	0	1	3	2	13	13	50
0.50–0.59	3	2	2	4	1	0	1	3	6	6	28
0.60–0.69	1	1	1	5	4	0	3	4	9	6	34
0.70–0.79	5	1	4	2	0	2	3	1	8	7	33
0.80–0.89	2	1	2	0	1	2	2	2	4	7	23
0.90–0.99	0	0	0	1	1	0	2	1	3	5	13
1.00+	0	0	0	2	4	3	7	2	17	7	42
Unknown	0	0	0	0	1	1	1	1	4	5	13
Total	34	24	26	31	15	15	22	24	98	96	385
Recommended dietary allowances gm.	1	1	1	1.2	1.4	1.3	1.4	1.0	0.8	0.8	
Number known	34	24	26	31	14	14	21	23	94	91	372
Number with less than recommended allowance	34	24	26	31	13	13	21	21	70	72	325
Percentage with less than recommended allowance	100.0	100.0	100.0	100.0	92.8	92.8	100.0	91.3	74.5	79.1	87.4

* Recommended allowances for age and sex of Food and Nutrition Board, National Research Council. Twenty-five children under 1 year of age are omitted.
† M=Male; F=Female

per cent of the colored subjects had deficient intakes according to the recommended allowances of the Food and Nutrition Boards.* The deficiency is even more striking when the individual age and sex groups are examined. Almost none of the colored children were recorded as having an adequate intake, and the deficiency is most frequent in those groups with highest absolute requirements, children 10–12, boys 13–20, and girls 13–15. The group with the fewest deficient intakes is the white men (21+), more than half of whose diets were adequate in calcium accord-

* National Research Council

ing to the standard used. The intakes of those with evidence of vitamin D or calcium deficiency are discussed in detail below.

The values for the blood phosphatase activity and the concentration of calcium in the blood are shown in Tables 2 and 3. Very few abnormal values were found and these are presented in detail in the discussion of the subjects who had clinical or laboratory evidence of vitamin D or calcium deficiency. In this discussion are included the very few abnormal values for blood phosphorus. The table of the results of the latter determination is omitted.

Thirty-five subjects had clinical or laboratory evidence of vitamin D deficiency (rickets). Twelve had clinical symptoms and signs, craniotabes (1), deformities of the chest, head or extremities (8), pot bellies (7), and muscular weakness (1), which were considered to indicate active rickets. Four were infants under 1 year, 4 were 1, and 4 were 2 years old. Five were white and 7 were colored. The x-ray showed active rickets in 3, healed rickets in 2, and was negative in 7. The blood calcium was slightly elevated in 2 (11.3 and 11.5 mg. per 100 ml. serum), and not determined in the rest. The blood phosphorus was normal in 7 and unknown in 5. The blood phosphatase activity was normal in 4 (in one it was 11.55 units), and not determined in 8. In addition to those with a diagnosis of active rickets, 54

TABLE 2

Distribution of Blood Phosphatase Activity Values Among Persons in the Survey According to Age, Sex and Race *

Serum Phosphatase Activity	*Age in Years*										
Bodansky Units per 100 ml.	*1–3 M-F* †	*4–6 M-F*	*7–9 M-F*	*10–12 M-F*	*13–15 M*	*13–15 F*	*16–20 M*	*16–20 F*	*21+ M*	*21+ F*	*Total*
					White						
0– 1.9	0	0	0	0	0	1	2	3	21	54	81
2.0– 2.9	1	0	0	1	0	3	6	16	95	87	209
3.0– 3.9	1	0	2	2	0	3	6	8	46	34	102
4.0– 4.9	0	2	4	3	0	3	11	1	17	16	57
5.0– 5.9	0	3	9	2	2	4	3	0	2	3	28
6.0– 6.9	3	5	13	7	1	1	2	0	2	1	35
7.0– 7.9	2	7	15	8	3	0	1	0	0	1	37
8.0–11.9	7	11	12	21	12	3	1	0	2	3	72
12.0–14.9	0	1	1	0	0	1	0	1	0	0	4
15.0–19.9	0	0	0	0	0	0	0	0	0	0	0
20.0+	0	0	0	0	0	0	0	0	0	0	0
Unknown	27	19	10	7	3	0	8	4	43	30	151
Total	41	48	66	51	21	19	40	33	228	229	776
					Colored						
0– 1.9	0	0	0	0	0	0	1	3	11	28	43
2.0– 2.9	0	0	0	1	0	1	5	12	43	40	102
3.0– 3.9	0	0	0	1	1	1	10	4	26	13	56
4.0– 4.9	0	0	0	0	1	3	3	1	8	3	19
5.0– 5.9	1	1	0	2	2	5	0	0	1	3	15
6.0– 6.9	2	3	1	5	1	3	0	0	1	2	18
7.0– 7.9	2	6	4	7	1	1	1	0	1	2	25
8.0–11.9	8	5	12	14	9	1	0	1	0	2	52
12.0–14.9	1	1	5	1	0	0	0	0	0	0	8
15.0–19.9	2	0	0	0	0	0	0	0	0	0	2
20.0+	0	0	0	0	0	0	0	0	0	0	0
Unknown	18	8	4	0	0	0	2	3	7	3	45
Total	34	24	26	31	15	15	22	24	98	96	385

* Twenty-five children under 1 year of age are omitted.
† M=Male; F=Female.

TABLE 3

Distribution of Blood Serum Calcium Levels Among Persons in the Survey According to Age, Sex and Race *

Serum Calcium Mg. per 100 ml.	Age in Years 1–3 M-F †	4–6 M-F	7–9 M-F	10–12 M-F	13–15 M	13–15 F	16–20 M	16–20 F	21+ M	21+ F	Total
					White						
<8.0	0	0	0	0	0	0	0	0	0	1	1
8.0– 8.4	0	0	0	0	0	0	0	0	0	0	0
8.5– 8.9	0	0	0	0	1	0	0	0	3	3	7
9.0– 9.4	0	1	4	1	1	0	1	1	9	12	30
9.5– 9.9	2	4	2	3	0	0	1	1	11	18	42
10.0–10.4	4	5	11	6	3	3	10	5	51	48	146
10.5–10.9	1	4	23	8	5	5	6	5	50	53	160
11.0–11.4	1	3	8	12	2	7	6	8	29	35	111
11.5–11.9	2	2	3	6	2	4	4	3	5	13	44
12.0+	0	0	0	3	1	0	0	4	7	3	18
Unknown	31	29	15	12	6	0	12	6	63	43	217
Total	41	48	66	51	21	19	40	33	228	229	776
					Colored						
<8.0	0	0	0	0	0	0	0	0	1	0	1
8.0– 8.4	1	0	0	0	0	0	0	0	0	1	2
8.5– 8.9	0	0	0	1	1	0	0	0	0	3	5
9.0– 9.4	1	2	0	0	0	1	0	2	5	9	20
9.5– 9.9	4	1	1	2	3	1	2	2	11	9	36
10.0–10.4	1	1	6	5	4	7	2	5	15	23	69
10.5–10.9	1	3	5	9	3	1	5	8	29	20	84
11.0–11.4	3	2	6	6	1	2	3	2	11	11	47
11.5–11.9	0	0	1	5	1	1	2	2	5	5	22
12.0+	0	1	1	2	1	1	1	1	1	4	13
Unknown	23	14	6	1	1	1	7	2	20	11	86
Total	34	24	26	31	15	15	22	24	98	96	385

* Twenty-five children under 1 year of age are omitted.
† M=Male; F=Female.

subjects, 36 white and 18 colored, aged 3 to 86, had skeletal deformities or dental abnormalities indicative of old, healed rickets.

Besides those with symptoms and physical signs, 11 subjects had only x-ray evidence of active rachitis. This was classed as severe in 1, moderate in 2, early in 1, mild, healing in 6 and questionable in 1. Two were older children (8 and 9), the others one year old or less. The blood calcium was determined in only the 2 older children and 1 infant. It was slightly elevated in the former (11.9 and 16.3 mg. per 100 ml. serum). The blood phosphorus was 7.3 mg. in the subject with a blood calcium of 11.9 mg., and 7.75 mg. in another. In 5 it was normal and it was not determined in 4. The blood phosphatase was 18.52 in one infant with moderately active rickets by x-ray, normal in 3 others, and not done in 7 (6 infants and 1 child). One of the infants was receiving an adequate supplement of vitamin D, another inadequate amounts. Besides those with x-ray evidence of active rickets 4 subjects showed healed rickets by this method of examination.

Twelve children under 12 years of age, in addition to those with clinical or x-ray signs of rickets, showed a greater phosphatase activity than normal (more than 12 units). Values ranged from 12.05 to 19.10, mostly between 12 and 14 units. Only 2 of these were infants, the others were 5 to 13 years old. Males and females were equally represented and 9 including the 2 infants, were colored. Seven were from 3 families. Blood calcium concentration was slightly elevated (11.3–11.7 mg. per 100 ml. serum) in 4 of

these, normal in 3, and unknown in 5. Blood phosphorus was normal except perhaps in 1 (6.0 mg.). Only 1 subject had received any vitamin D supplement and that only for 6 weeks.

Sixty-one older children and adults had phosphatase values over 6 units. With 2 exceptions these ranged from 6 to 12 units and were proportionately more frequent in the Negroes than the whites. An interesting finding is the decidedly greater number, relatively, of males 13–15 with these higher values compared with females of the same age or compared with the males of older ages.

Only 5 subjects showed symptoms or physical signs compatible with calcium deficiency, 1 a child of 1 year and the others all adults, women 39, 44, 55, and 86, respectively. The infant had a history of recent spasms and a delayed dentition. It was breast fed with supplemental food but received no form of vitamin D. The x-ray showed osteoporosis, blood calcium was not determined, and the blood phosphorus and phosphatase were normal. The colored woman, 44, had had 14 pregnancies, gave a positive Chvostek and a questionable Trousseau's sign, and showed a doubtful osteoporosis on x-ray. Of the other women, one had had 11, one 2, and the other no pregnancies. Two had kyphoscoliosis and all showed osteoporosis on x-ray. The blood chemistry determinations were normal in 3 of the women and not done in the 4th. None were taking any form of vitamin D. Calcium intakes were 0.197, 0.245, 0.555 and 0.811 mg. daily.

In addition to those with clinical symptoms and signs, 57 subjects, 10 colored and 47 white, showed an osteoporosis on the x-ray examination. In none was the osteoporosis severe or of a grade seen in clinical osteomalacia. Of these only 16 were males, including 3 children, and 41 were females with 6 of them children. Of the 13 adult males, 9 were 40 years old or over. Thirty-three of the 35 adult women were 40 years of age or more.

Thirty of the 35 adult women had had 1 to 11 pregnancies each, 18 had had 5 or more. The calcium intake varied from 0.172 to 2.201 gm. daily, with 41 having an intake below 0.8 gm. Two subjects had taken an adequate supplement of vitamin D, one 7 months and one several weeks previously.

Blood calcium was slightly elevated in 9 (11.1–11.6 mg. per 100 ml. of serum), 8.9 mg. in 1, and not determined in 11. All phosphorus values were normal. The phosphatase was abnormal in only 2, 9.71 units in a 56 year old woman with 10 pregnancies and a calcium intake of 0.258 mg., and 8.02 units in a woman of 65 with 7 pregnancies and an intake of calcium of 0.548 mg.

Besides those with signs and symptoms of calcium deficiency or osteoporosis on x-ray examination, 14 subjects had a concentration of calcium in the blood serum of less than 9 mg. per 100 ml. They were about equally divided between white and colored, male and female. Four were children, an infant 2, and 3 boys 12, 13, and 15 years of age. Five of the adults were 50 years old or more. All of the women had been pregnant one or more times and 1 was pregnant when examined. The intake of calcium was below 0.8 gm. in 13. In 11 the blood calcium was between 8.5 and 9.0 mg. and in only 1 was it below 8.0 gm. (6.9). This subject presented no other significant findings. Blood phosphorous was 6.92 in the 2 year old child, normal in the rest. The blood phosphatase was normal in all. Only the 2 year old child had received vitamin D supplement, an adequate dose for 6 weeks.

The relation of dental structure, development, and decay to nutrition is so confused that an analysis of dental de-

fects has been reserved for a separate study. However, it may be noted that preliminary analysis shows no relation between the large amount of dental caries observed (approximately 60 per cent of all subjects) and any of the aspects of vitamin D or calcium nutrition.

DISCUSSION

Based on the number with one or more of the positive signs of vitamin D deficiency (symptoms and physical signs, x-ray changes, and high phosphatase values), the incidence of this deficiency in the total population is very low, about 2 per cent. Such a calculation ignores, however, the fact that it is impossible under the condition of the survey to detect and distinguish slight vitamin D deficiency in adults and that this deficiency is confined in a practical sense to early childhood. Considered as rickets, a characteristic and well defined disease of vitamin D deficiency in childhood, the incidence will again depend on the age limits established. The inclusion of all ages for which the childhood limits of normal phosphatase concentration apply (12 units), means the inclusion of a large number of subjects in an age period beyond that in which active rickets ordinarily occurs. On the more usual basis of ages up to 3 years, rickets was found in 23 of 94 subjects (24 per cent), an incidence similar to that often estimated for such a population. Even 24 per cent may not portray accurately the incidence of *active* rickets. Of the 12 subjects with symptoms and physical signs, only 3 had x-ray evidence of active rickets. Though the x-ray is not infallible it is well known that it is often impossible to determine active from inactive rickets of a mild grade by physical examination alone. Even the x-ray cannot detect the mildest grades of rickets or distinguish minimal activity. Unfortunately, in the present survey the infrequency of the determination of phosphatase activity in the youngest subjects made this test of little help, and its value is poorly determined. Of the 3 subjects with rickets on physical examination and positive x-ray signs, 2 had no phosphatase determination. Phosphatase was normal in the other. In the 2 with physical signs and an x-ray diagnosis of *healed* rickets the phosphatase concentration was normal in one and borderline in the other (11.55 units). Of the 7 with physical signs and a *negative* x-ray, the phosphatase was normal in 1 and not done in 6. In the 11 subjects with x-ray evidence of rickets and no physical signs the phosphatase was determined in only 1. In that one it was abnormally high (18.52). Only 2 children in the age group under discussion had elevated phosphatase as the sole evidence of rickets.

Despite, however, the inability of physical examination or even x-ray to distinguish accurately active from inactive or healed rickets it is probably advisable to include both in a survey involving the age period of greatest susceptibility (up to 3 years) because they would give a fairer picture of the actual incidence of mild rickets in a group in which mild rickets is rapidly "cured."

The subjects over 3 years of age with abnormally high phosphatase activity are of particular interest. Although they have been classed with the vitamin D deficient (rachitic) group, the significance of high values in these older children is not clear and it is possible that they do not indicate such a deficiency. It is possible that they reflect osteomalacia, the manifestation in adults of vitamin D or calcium deficiency, or perhaps more often a combination of both. However, if this is the explanation, in no case were the deficiencies sufficiently severe to cause x-ray evidence of osteomalacia, or a

hypocalcemia. Blood serum calcium values in fact tended to be a little elevated.

Only 7 of the 35 subjects with some evidence of rickets were given any vitamin D supplement. For some of them the dosage was inadequate, and others had begun it only recently, apparently after the appearance of the disease. The practical necessity of giving vitamin D supplements to meet requirements and prevent rickets in early childhood is generally accepted, and the lack of such a supplement would of itself seem strong evidence of a vitamin D deficiency. However, lack of such a supplement was just as frequent in those who had no evidence of rickets. Another factor in the occurrence or non-occurrence of rickets is the rate of growth and the state of nutrition with respect to other factors, an influence which must be taken into account in this study. It is interesting therefore that although a disproportionate number with signs of rickets were Negroes, less than one-third of the total number belonged to the low income group.

Actual calcium deficiency seems to have been very uncommon. Although 76 subjects had some of the changes which might represent such a state, it is very unlikely that more than a few of these actually had a deficiency, in spite of the frequency of deficient calcium intakes as judged by the standards used. Three subjects, the infant with spasms, the 44 year old woman with the positive Chvostek and questionable Trousseau's sign, and the 29 year old man with a blood calcium of 6.9 for which no other cause was apparent, probably had such a deficiency. It is also quite possible that 2 of the 3 women with the spinal deformities can be included and perhaps the 2 women with osteoporosis and an elevated phosphatase. It should be emphasized however that calcium deficiency alone is unlikely.

In the majority of these 76 subjects the only evidence of calcium deficiency was an osteoporosis, detected on x-ray examination. Osteoporosis of a grade exhibited by those subjects is believed to occur in old age and in women at and after the menopause, unrelated to calcium deficiency. Most of our subjects with osteoporosis fall into one of these two groups and, in the absence of stronger evidence to the contrary, one is forced to conclude that few if any of them had an actual calcium deficiency.

Unfortunately for its detection calcium deficiency is not accompanied in man by a hypocalcemia except in severe or very chronic cases. Even the finding of a concentration of calcium slightly below the arbitrary lower level of normal is often without significance, and it is likely that for the majority of the subjects with values below 9 mg. per 100 ml. the finding is of no physiologic significance. Only for the 2 or 3 lowest values may there be an intimation of actual calcium deficiency.

SUMMARY

Certain features of the nutrition of a rural population in middle Tennessee in respect to vitamin D and calcium are presented. These include the individual dietary intake of calcium, the findings of a medical history and physical examination, the concentration of calcium and phosphorus and the level of alkaline phosphatase activity in the blood, and the results of an x-ray of the examination of bones of the wrist and forearm, ankle, and leg.

A high incidence of a deficient intake of calcium, on the basis of recommended allowances of the Food and Nutrition Board, was observed, but clinical or laboratory evidence of calcium deficiency was uncommon. Clinical or laboratory evidence of rickets (including x-ray) was found in about 25 per cent of the subjects under 3

years of age, but in some of these the disease was probably healed. Despite some x-ray evidence of osteoporosis and an elevated phosphatase activity in a few older children and adults, instances of probable deficiency of vitamin D, or combined vitamin D and calcium, were very few among these subjects.

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Memorial to Dr. C. C. Young

A concurrent resolution adopted by the House and Senate of the State of Michigan commends the achievements and honors the late C. C. Young, D.P.H., who for many years was Director of the Bureau of Laboratories of the State Department of Health in Lansing. Included in the memorial is the following resolution:

" That the Michigan Legislature convened in Extraordinary Session . . . on behalf of the people of the State of Michigan, in order that the memory of Dr. C. C. Young shall be forever preserved, hereby designate that the Administration Building of the Michigan Department of Health shall hereafter be known as the ' C. C. Young Public Health Laboratory.' "

The resolution also provides that a suitable plaque be erected in the laboratory.

Early Days of the Public Health Education Section

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American Red Cross, North Atlantic Area, New York, N. Y.

A HALF century of American Public Health Association history unfolded before its Section on Health Education and Publicity was born. The infant arrived not with a silver spoon in its mouth; in fact its early days were precarious ones. Once these were successfully past, the lusty youngster showed vitality and grew rapidly and now numbers 806 members, of whom 137 are Fellows. Its name meanwhile has been changed to the Section on Public Health Education.

The delegate to the Association's Annual Meeting in 1920, who came because he was starved for a bit of nourishment that would help him grow up to his job of health education, would have to shop from section to section to satisfy his hunger. He might even return home still hungry and without having been warmed by the companionship of kindred spirits who were equally famished. There was a growing number of such members of the Association whose chief interest was health education, in the very bosom of the public health family they felt lost. Our hypothetic delegate was free as in a cafeteria, to choose from the programs of the eight sections into which the Association was then divided; but what choice did he have? He was welcome to listen to a paper on "Sanitation in Bakeries," or, if he were not particularly bread-minded, to a paper on "Hookworm in California Gold Mines," in the Industrial Hygiene Section. From there he had the privilege of wandering to the meeting of the Laboratory Section to hear a treatise on "Detection of Manural Pollution in Milk," another on "Standardization of Botulism Antitoxin," and if he was still awake, a paper on "The Helpless Narcotic." The Food and Drug Section offered him a dissertation on "Evaporation of Fruits and Vegetables," and Vital Statistics tried to lure his attendance by offering a paper on "Birth and Death Certificates as Legal Evidence." Surely his pulse quickened when he discovered that in the Child Hygiene Section he would hear about "Mothercraft Instruction for School Girls." He might gather some crumbs there, and he wrote on his cuff (the detachable kind) the time and place for the meeting of the Industrial Hygiene Section where he was promised a paper on "Health Education in Industry."

Among these scattered but fairly numerous forgotten men and women who were stirring restlessly there was one catalyst, Evart G. Routzahn, who today is held in endearing memory by the Section as its father. Routzahn found a responsive champion in Dr. William F. Snow, who in turn interested Dr. Lee K. Frankel, Past President of the Association, in the project of organizing a health education group. Routzahn had many friends and a persuasive personality and soon there was a well-voiced demand for recognition of those who needed help in health education practice. At the jubilee meeting of the Association, cele-

brating its fiftieth anniversary and held in New York, November 14–18, 1921, there appeared for the first time a special section program devoted entirely to health education. Permission to form a provisional section had been granted by the Governing Council, and the program was held under the Section's auspices. The purpose of the session was described in the printed program in these words:

> This session aims to bring together the public health workers who are interested in popular health education and publicity. The aim will be to take some first steps toward frankly facing the practical problems which need to be solved in order to secure the results desired from the millions of pieces of printed matter that are being distributed, the great number of addresses, and the increasing use of a growing variety of educational material.

That first session verified the belief and contention that potential interest existed; it was well attended and the discussion was lively. The Symposium on Motion Pictures was conducted by Mr. Routzahn as chairman, and six persons participated. The second session was devoted to a symposium on How To Further Progress in Health Education and Publicity, led by Dr. Snow, and again there were several energetic participants. The spontaneity of these meetings contrasted favorably with the usual formality of other Section meetings and this at once attracted the younger members of the Association who felt no particular allegiance to a given Section and, perhaps, caused some lifting of eyebrows of older members. At the ensuing meeting of the Governing Council held a month later, an influential member reported favorably on the Section, stated that it had attracted 175 persons, and recommended that the Section be continued on probation, so to speak, for another year.

The following year, 1922, the Association met in Cleveland. Dr. Lee K. Frankel was chairman and B. R. Rickards, secretary of the trying-to-be-born section. Again progressiveness was reflected in the unique program. It was something of an innovation to invite non-members of the Association, men not identified with public health, to take a leading part in the program, but that is what the Section did. William Feathers and William Henry Baker, both eminent in the fields of typography and publicity, conducted at the first session what was called a "Clinic on Printed Matter." Samples of health publications had been selected for review, analysis, and criticism. Copies had been supplied to the audience and the two experts analyzed one after another of the pamphlets from the standpoints of copy, form, and typography. That was a lively and instructive session and stirred much comment which led to the improvement of printed matter (and how sorely that was needed!), for the authoritative words of men who were in no way connected with public health and who could view the products objectively, carried weight. So successful was this technic that "clinics" continued to be the popular type of program for the Section for years after; and they have not yet lost their attraction-power and interest. The second session was devoted to a symposium on newspaper publicity. Once more permission to conduct a session on health education the next year was granted.

At the Boston meeting, held in 1923, there was another Clinic on Printed Matter, under the chairmanship of Evart G. Routzahn and the leadership of Phillip S. Platt, and there was also a luncheon session at which Motion Picture Programs and Problems were discussed. As usual, the attendance was good, so good that those standing in the doorway attracted others who were curious to learn what the excitement was about, and thus spread the

fame of the Section. The big news event however, was that the Section had been accepted in full status—at last the lusty urchin was weaned and legitimatized! That year the Fellowship plan was introduced and only Fellows were eligible to hold office—which put a strain on the Section for, while its membership had grown somewhat, only a few were Fellows. We did, however, manage to assemble a slate, and duly elected H. E. Kleinschmidt, Chairman, B. R. Rickards, Vice Chairman, and Marjorie Delavan, Secretary. With high hopes we cheered ourselves and looked forward to the next meeting.

Though now properly recognized and with representation on the Governing Council, the Section realized full well that only struggle would keep it alive. Before leaving the Boston meeting the half dozen of us who were carrying the responsibility resolved that we would employ the shining hours until the next meeting by building up the membership, by trying to serve the members, and by planning our next meeting long in advance. The officers were widely scattered—Albany, N. Y., Lansing, Mich., and Toledo, Ohio; but the mail served us well and in our travels we did manage one or two visits. Meanwhile, Routzahn in New York saw to it that readers of the *American Journal of Public Health* were not neglected, and from his office, bits of colored paper with cryptic messages, passing thoughts, helpful hints, fluttered to our several desks. Sir William Osler always kept a package of post cards handy on which he jotted brief notes to his friends on the spur of the moment—and what a rich source of information these cards were later when they were collected by his biographer! Routzahn used memorandum pads of various hues and a typewriter that seemed to have no punctuation marks. What would you make of a pink slip coming in the morning mail like this:

HEK
Smith wants help on movies
Bananas are being advertised as health food—true?
Send Jones ideas on newspaper leads
EGR

Routzahn's telegraphic confetti was the subject of good-natured banter, which he enjoyed; but that his memoranda commanded attention and stimulated us to act was self evident.

At the Association's meeting held in October, 1924, at Detroit, the Section, like a small boy at a family party, really made its existence known. Besides its two sessions it joined with the Vital Statistics Section in a third meeting, and sponsored two luncheon meetings and a dinner.

For the third time a clinic on printed matter was conducted, testifying to the popularity of this type of program. But the session that was long remembered by the many who crowded into the room was one on Newspaper Publicity. This time, two outsiders, E. G. Burrows, of the Department of Journalism of the University of Michigan, and Lee A. White of the *Detroit News*, and one speaker long identified with health education, Philip P. Jacobs, led the symposium. A note printed in the program stated: "The audience will be supplied with newspaper articles discussed by the speakers." When this session was planned we wondered how to furnish the audience with clinical material, which is a necessary part of the clinic technic. Like medical students who crane their necks vainly to see what the surgeon is doing, our audience would not be able to follow the clinicians as they analyzed the subjects before them unless they had copies at hand. Furthermore, one value of the printed matter clinic was that the audience accumulated samples of good and poor pamphlets, with the clinician's comments, and carried them home for

guidance in their future printing plans. How could clinical material consisting of newspaper articles be furnished? The difficulty was solved with the help of Mr. White. He promised that if we would collect clippings of the articles we wished to have examined, he would have them reprinted in standard newspaper form by his newspaper, *The Detroit News*. To Marjorie Delavan goes the credit for having assembled from all parts of the country a fine assortment of short news articles on health which had actually been printed, and these were arranged on a newspaper page under the masthead of the *News*. A plentiful supply was printed. The evening before the session, a few daredevil members of the Section peddled these sheets in newsboy fashion among the delegates, in the hotel lobby and at the entrance to the ball room where guests congregated for the Association's annual dinner. It was not a very dignified performance but our customers were amused and even some venerable Fathers in Israel smiled tolerantly at the adolescent antics of this new Section—well, they were the "publicity boys," and why shouldn't they practise their trade even at a serious conclave.

Next day our assembly room was crowded with eager listeners and with a liberal sprinking of old-timers from other sections who came to see the fun. All three speakers did a superb job; once again the Section had proved its reason for being—it was established and feeling its oats. A few more Fellows had cast their lot with the new Section and there was little difficulty in finding able candidates for office.

Like other Sections, ours was given the privilege of occupying a department in the monthly *Journal*. Routzahn was appointed editor, and filled the columns with short items collected from everywhere—a new set of posters put out by the Blank Health Department, a novel stereopticon device, quotations from a telling speech, source material on this subject and that. It meant, undoubtedly, that he spent much of his time collecting and classifying such material and writing many letters. His zeal in keeping in touch with health education activities all over the country was amazing.

Today Health Education Headquarters has become an established institution at the Association's Annual Meeting. There the novices and the veterans congregate, and there they find an abundance of material, all neatly indexed and displayed, with attendants in charge always willing to assist the searcher for ideas. Posters, booklets, exhibit devices, catalogues—a complete department store of health education materials and methods. This too was Routzahn's creation. And always, Mary Swain Routzahn was so closely associated with Evart that it became customary to speak of "The Routzahns."

* * *

At the Ninth Institute on Public Health Education, held in October, 1942, and attended by 322 health workers, Professor C.-E. A. Winslow said: "The Health Education Institute is a most remarkable institution and it is a great pleasure to watch its progress from year to year. . . . It is fascinating to see its scope widen and deepen."

That the Institute has won the respect of public health leaders is a tribute to the Public Health Education Section which created and nurtured it at a time when the Section was still weak. More than one public health veteran has expressed astonishment when, engrossed in other affairs, he accidentally discovered for the first time perhaps, the vigor and exuberance of this offspring of the Section. The records of its origin are scanty, and I am indebted to several friends who have aided my memory in reconstructing this sketch.

When the Health Education Section was groping its way in the late 20's, some of the Fellows of that Section felt that it was not enough merely to plan an annual program but that it should develop some means of helping the members to become better craftsmen in the art of health education. One suggestion made by Dr. Iago Galdston was that a definite course of instruction be provided in which the philosophy, art, and technic of health education would be taught. At the time there were few opportunities for a student to acquire such instruction in universities or schools of public health, and the worker already engaged who felt the need of a practical postgraduate course had simply nowhere to turn.

Galdston pointed out that from the membership of the Association itself, could be drawn specialists in a variety of skills such as no university could provide; and that an Institute would bring the school to the student without obligating him to sacrifice much time from his work. It was thought also that an Institute would help the Section to define more clearly its objectives and functions, for health education was a sprawling terrain with indefinite borders and unexplored areas. Finally, an Institute held in connection with the Annual Meeting of the Association, would be a means of reaching many health workers who seldom had opportunity to confer with more experienced colleagues. Since the Association's meeting was held each year in a different locality and attracted many attendants from nearby, each Institute would bring a short course to those who did not commonly enjoy the privilege of travel. It was not the purpose to duplicate the Section program, though it was difficult for some to see how that could be entirely avoided.

Galdston's suggestion was considered by the Council of the Section but no immediate action was taken. He persisted however, and after some four years the Council appointed a committee to evolve a plan. This committee, consisting of Iago Galdston, Evart G. Routzahn, and H. E. Kleinschmidt, met early in 1932 and several times thereafter. It soon developed that the purpose of the Institute was not entirely clear even yet, for there was at first difference of opinion as to whether the course should be an authoritarian one in which the leaders would expound known facts and tested procedures, or a discussion outline for the exchange of ideas on new and not yet established methods, and on more or less technical questions. The former would be in the nature of an academic course, somewhat elementary and led by recognized leaders; the latter, more nearly of a research character, would be exploratory, discussive, critical, and of value primarily to those who had already attained a degree of mastery by reason of experience. To say that one method was of the "academy," and the other of the "university" type would be over-simplification, but at any rate, there was something favorable to be said for both.

Health education was attracting many new practitioners into its ranks and many of them were without much experience. To assist them in acquiring skill was a worthy enterprise. On the other hand, a considerable number of workers had already mastered the elements of health education and felt the need of group exploration; and that too would be of value to all, presumably, for new areas would thereby be discovered which would be for the common good. In the end, it was agreed that as a guiding policy it would be better to plan the Institute for those who wished elementary training.

Important as it seemed to the planning committee to establish a definite policy, the difficulty of actually living within it in practice became apparent

when the program was formulated and the sessions were held. As a matter of fact, the Institute partook of both methods, didactic and exploratory. In the announcement it was stated that:

> The purpose of the Institute is to provide instruction in the content and methodology of Health Education to a limited number of persons actively engaged in Health Education. The students whom it is desired to attract to the Institute may or may not have had training in Health Education in one or the other of the few institutions where it is available. They may have had a little or considerable experience. They may devote all their time to this work or it may be merely one of several activities. In any event, Health Education is for them a major preoccupation and they must from time to time formulate programs of activities in Health Education and carry them through.

The first Institute was launched with fine enthusiasm and some misgiving. (By the way, the circular which announced the new venture was one of the handsomest pieces of printed matter ever issued by the Association.) The attitude of the Association was none too encouraging for, while authority to hold the Institute was duly granted, no great enthusiasm was manifested by the Association's governing body. However, the President of the Association in 1932, Dr. Louis I. Dublin, was energetic in his support and earnestly urged attendance, and the staff of the Association was more than helpful. A fee of $5 and registration in advance were required of all students and this, it was feared, might be a deterrent. When the meeting opened, however, great numbers of unannounced students presented themselves in addition to those who had registered, and the quarters provided for the meeting proved entirely too small.

The staff of the Institute consisted of the following persons:

Iago Galdston, M.D., *Director*
Bertrand Brown
Evart G. Routzahn
Mary Swain Routzahn
Clair E. Turner, Dr.P.H.
W. W. Peter, M.D.
Ira V. Hiscock
H. E. Kleinschmidt, M.D.
George C. Ruhland, M.D.
W. W. Bauer, M.D.
Raymond S. Patterson, Ph.D.

This staff made careful preparations and planned to avoid duplication as much as possible. What the staff set out to do is evidenced by the program:

FIRST SESSION

Discussion of the instruments employed in Health Education; pamphlets, weekly and monthly publications and bulletins, charts, posters, health talks and radio talks; their special utility and their limitations.

SECOND SESSION

The responsibility of the health educator for the authenticity of his material. How to go about securing dependable information to present on the items selected, to the indicated audiences, and through the preferred media. Tapping authoritative sources. The coöperation of the medical profession.

THIRD SESSION

How to formulate a program of Health Education suitable to the community. How to determine the allocation of staff, money, and effort. This problem will be considered from the viewpoint of both the official agency, that is, the department of health, and of the voluntary agencies.

FOURTH SESSION

The avenues through which the program might be formulated; the population at large, special groups, schools, primary and secondary, teacher training organizations, work shops and work places, commercial organizations, etc.

It was a stimulating meeting, though not without its faults. Very soon after assembly it became apparent that the experience levels of the members of the group were of wide divergence, and this made it impossible to keep the discussion always on a common level. For each session there were a chairman, a discussion leader, and a discusser. Interruptions from the floor were invited, which privilege was freely utilized, and therefore it became impos-

sible to control the direction of the discussion. My recollection is that there was considerable wandering from the topic. But not once during those three tightly packed days did interest flag, and it was generally felt that the Institute had vividly demonstrated its need and value. After that trial experience there was no further question about repeating the effort. In succeeding Institutes the student group was divided into sections, each dealing with a different topic. At the final general session reporters summarized the proceedings of each section, so that all might share at least the more important highlights. In subsequent years, new problems have arisen, the charted course has been altered from time to time and new leaders have come to the fore—but that is another story.

* * *

From the *American Journal of Public Health*, June 1939:

"Members of the Public Health Education Section of the American Public Health Association deeply mourn the loss of their leader and friend, Evart G. Routzahn. It is almost impossible for us to think of the Section without him, for it was his personality that gave it zest and color. At a time when only a scattered few were giving serious thought to health education as a specialty of public health E G R saw the advantage of banding such workers together. He nursed the foundling section, laid on the doorstep of the American Public Health Association, until it was accepted as a lusty member of the public health family. All through the years he guided its stumbling gait and, happily, he enjoyed the satisfaction of seeing his child grow sturdy and respected.

"Though E G R never sought honor nor office, both were thrust upon him and he carried them well. For the sheer love of the cause he labored for its well-being. Each month his cryptic paragraphs in the *Journal* stimulated us; many of us turned first to his pages. Annually his exhibit was the rallying place of all loyal members of the Section, and many a youngster and veteran in the field of health education found treasure there. To E G R we turned often and never in vain. With the advice he gave there was always a glint of humor, with his service always a beaming smile. His criticism, eagerly sought, was always penetrating, but never with a sting. Mostly we loved him for his friendliness—for his bubbling good will.

"We thank God that the bench mark E G R is indelibly impressed upon the Public Health Education Section. Time, which mellows sorrow, will never efface that bench mark. We who worked, and planned, and laughed with him have been enriched by the comradeship, and that wealth grows more precious with his passing."

Rheumatic Fever in Cincinnati in Relation to Rentals, Crowding, Density of Population, and Negroes

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RHEUMATIC heart disease is now the first cause of death among children aged 10 to 14, and is second only to tuberculosis at ages 15 to 25.[1] Despite the importance of this disease its cause is not known and its epidemiology is not completely established. Epidemiological thought in the past has been influenced by the early English report[2] that rheumatic fever was an affliction of the artisan class, and not of the impoverished. However, all authorities do not agree with this view, and Glover[3] expresses his opinion as follows: "The incidence of acute rheumatism increases directly with poverty, malnutrition, overcrowding, and bad housing." The association of these conditions with rheumatic infections has been examined critically in only a few surveys covering an entire community, namely those in England,[2,4,5] Dublin, Ireland,[6] Australia,[7,8] New Haven,[9] and Philadelphia.[10] The epidemiology of rheumatic infections, including the epidemiology of acute hemolytic streptococcal infections, has been well summarized by Paul.[11]

METHOD OF SURVEY

The authors have recently completed an examination of all hospital admissions with rheumatic conditions, at all ages, in Cincinnati for the 11 year period 1930–1940.[12] There were 3,475 admissions and 2,178 cases studied in the survey (Table 1).* Among these 2,178 cases there were 583 persons with a listing of rheumatic fever with or without rheumatic heart disease or chorea. Among these, home addresses in Cincinnati were available for 517. The home addresses used were given at the time of the first hospital admission during the period under study. These 517 patients had acute rheumatic infections, most of them with joint symptoms. All of them were not necessarily initial infections. It was believed that these acute cases would provide the most significant epidemiological data. All persons who had rheumatic heart disease without rheumatic fever, and all persons with uncomplicated chorea were omitted from the socio-economic analysis reported at this time.

Through the courtesy of Dr. Floyd P. Allen, Director of the Research

* The material for this paper was collected when the authors were associated with the Department of Bacteriology, University of Cincinnati College of Medicine, The Max Stern Heart Station for Rheumatic Heart Disease, and Children's Hospital, Cincinnati, Ohio.

* It should be noted that a distinction has been made between persons, cases, and admissions. One case represents one hospital's records on one person, although that case may include one, two, or more admissions

TABLE 1

Cases of Rheumatic Infections Admitted to Cincinnati Hospitals from January 1, 1930, to December 31, 1940

	Number		Cases Utilized * in this Socio-Economic Analysis
All rheumatic heart disease	1,770		
Rheumatic heart disease with rheumatic fever and subacute bacterial endocarditis		9	9
Rheumatic heart disease with subacute bacterial endocarditis		51	
Rheumatic heart disease with rheumatic fever and chorea		8	8
Rheumatic heart disease with rheumatic fever		312	312
Rheumatic heart disease with chorea		52	
Rheumatic heart disease, uncomplicated		1,338	
Rheumatic fever without rheumatic heart disease	254		
Rheumatic fever with chorea		7	7
Rheumatic fever, uncomplicated		247	247
Chorea, uncomplicated	154	154	
Total	2,178	2,178	583

* in so far as addresses were available (517 of the cases)

Division, Cincinnati Public Health Federation, the authors were able to locate each home address in its proper census tract in the city. Dr. Allen has also kindly supplied the following information for each census tract:

1. Median monthly rental, 1940.
2. Per cent of occupied dwellings with 1.51 or more persons per room, 1939–1940. (This served as an index of crowding.)
3. Per cent of dwellings occupied by persons of a race other than white, 1939–1940. (Essentially an index of Negro population.)
4. Persons per net habitable acre, 1940. (This was taken as an index of density of population.)

There is a difference between *crowding,* or persons per room, and *density of population,* or persons per acre. The former is more important epidemiologically. The latter may simply be the result of many apartment houses or private homes close together.

DISTRIBUTION OF RHEUMATIC FEVER BY CENSUS TRACTS

A graphic presentation of the distribution of rheumatic fever in Cincinnati is given in Figure 1. A few words of explanation are necessary in this connection. There are 107 census tracts. Four of these were omitted for reasons as follows:

1. C. T. 32 includes an Orphans' Home and the Cincinnati General Hospital. Four of the 5 cases occurred among the inmates or professional staff of these two institutions, and the home addresses were therefore considered inadmissable.
2. C. T. 59 had only one case in 11 years, but the sparse population caused the annual incidence to appear to be more than 10 cases per 100,000.
3. C. T. 85 had only 3 cases in the 11 year period, also in an area of sparse population, so its incidence likewise appeared to be more than 10 per 100,000.
4. C. T. 24 had a median rental of $16, 17 per cent crowding, 57 persons per habitable acre, and 11 per cent Negroes, but an annual incidence of only 3 cases of rheumatic fever per 100,000 population. This tract is located entirely on a steep hillside (Sycamore Hill to Vine Street). It was omitted because the authors believed that the inhabitants were a selected population. No one would willingly move into or remain in the area unless in good health and able to endure the daily hill climbing. These 4 regions are indicated in Figure 1 by the number of the tract plus a question mark. The minor effect which the omission or inclusion of these 4 tracts had on the statistical significance of the data is described later.

Four other census tracts presented unusual features but were nevertheless

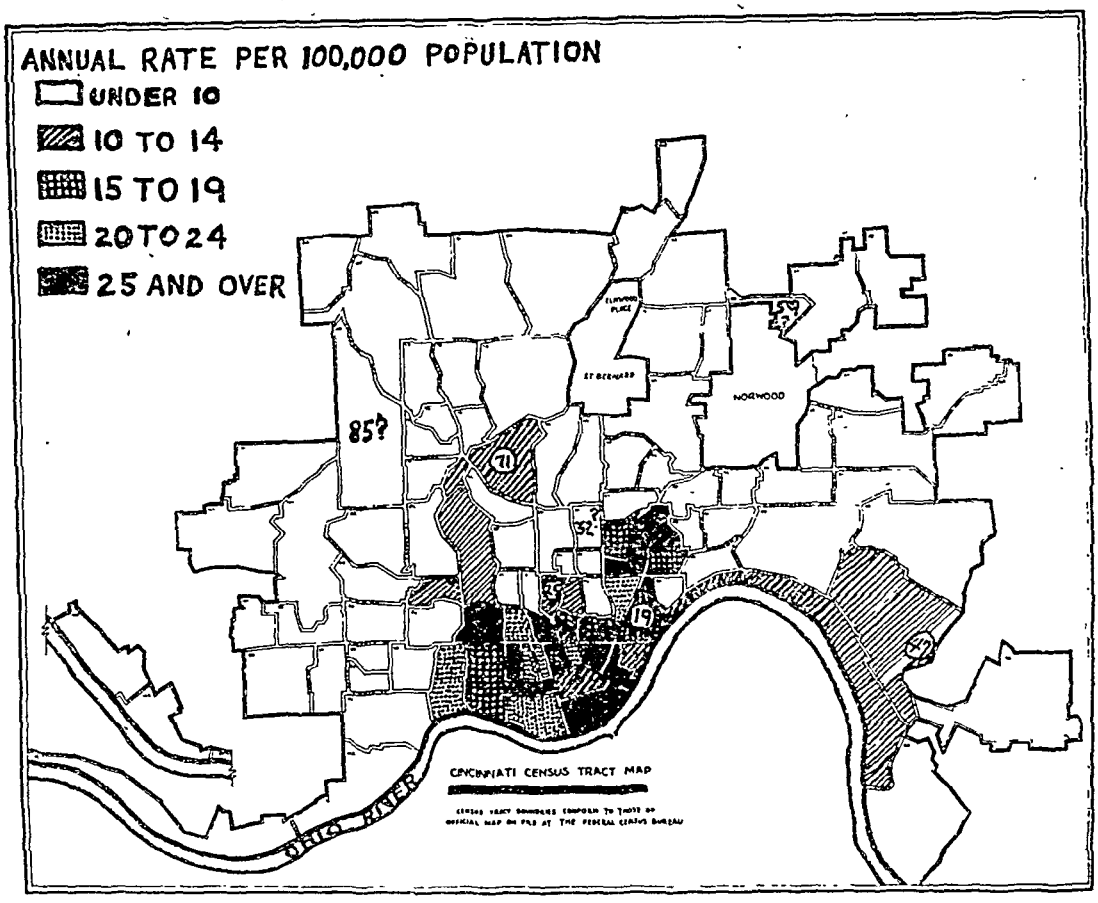


FIGURE 1—Distribution by city census tracts of 517 cases of rheumatic fever admitted to Cincinnati hospitals during 1930-1940, based on the mean annual number of cases per 100,000 population. Population based on an average of the U. S. Census of 1930 and Census of 1940. (See text regarding Census Tracts 19, 25, 47, 71 and 24, 32, 59, 85.)

included. All had an annual incidence of more than 10, but the median rentals were over $21.65, and there was no crowding and there were no Negroes. Census tracts 19 and 47 were not economically uniform and contained homes of both the poor and well-to-do. C. T. 25 was rather uniformly an area of lower middle class homes, and C. T. 71 an area of expensive homes, but one less case in each tract would have reduced the annual incidence of rheumatic fever to less than 10 per 100,000 population.

TOPOGRAPHY OF THE CITY IN RELATION TO RHEUMATIC FEVER

Most of the patients resided in four sections of the city (Figure 1):

1. The "basin area," which is between the river front and the hills rising about a mile northward. This includes most of the slums and all of the central business district.

2. The Mill Creek Valley industrial area which runs northward in a finger-like process on the western side of the city.

3. C. T. 43 and 44 which extend eastward along the river below Columbia Parkway. This parkway is a broad concrete highway along the river above which are bluffs where part of the better residential district is located.

4. C. T. 34, 35, 36, and 37 in the Lincoln Heights District adjoining the basin area on the northeast.

The last group of tracts is easily identified in Figure 2 as comprising those marked by either cross-hatching or diagonally-slanted lines. This is not

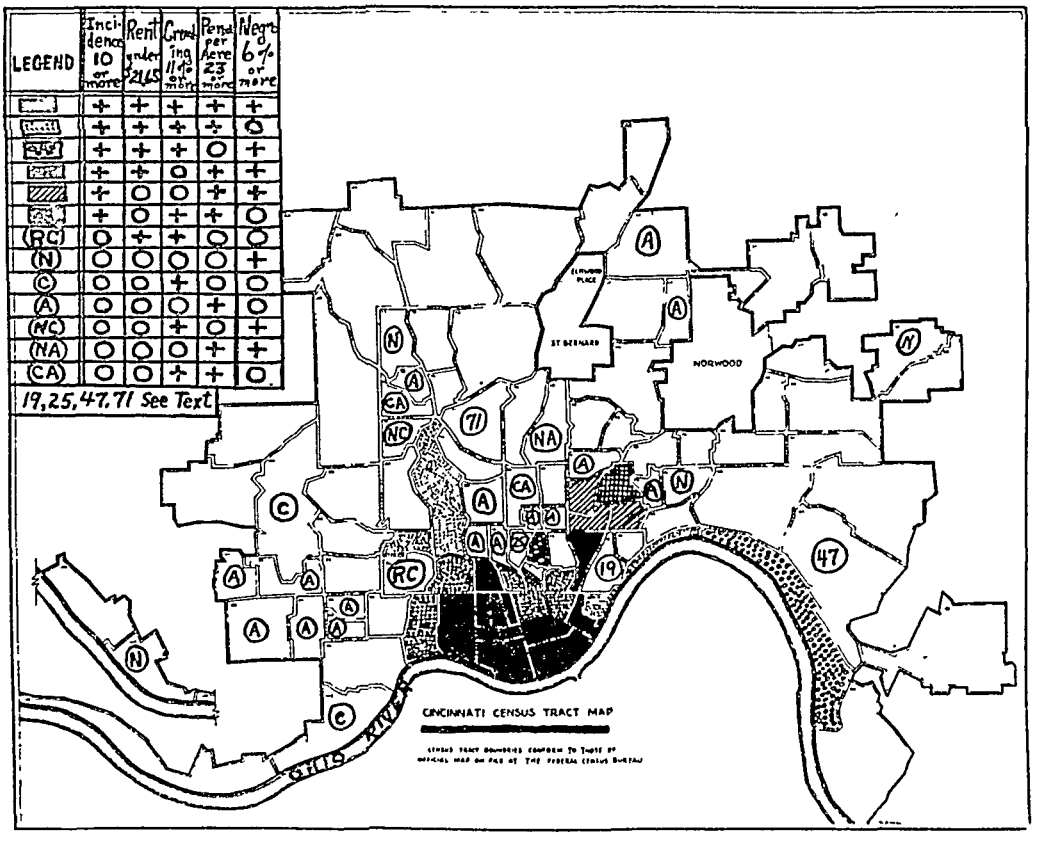


FIGURE 2—Annual incidence of hospitalized rheumatic fever per 100,000 population in each census tract, in relation to rentals, crowding, density of population, and Negro population. Letters in circles indicate characteristics of tracts so designated; thus, RC means rents low and crowded, N means high proportion of Negroes, etc.

a slum area but has a large Negro population, respectively 18, 7, 97, and 46 per cent. Furthermore, it is not a low lying or damp section but is in an elevated part of the city. This would seem to eliminate dampness and proximity to water courses as a possible major factor of importance.

SOCIO-ECONOMIC DISTRIBUTION OF RHEUMATIC FEVER

The relation of rentals, crowding within the home, density of population per acre, and Negro population to the incidence of rheumatic fever by census tracts is portrayed in Figure 2. There are some striking correlations. All 11 tracts (marked in solid black) which had low rents, crowding, dense population, and Negroes, also had a significant level (10 or more annual cases) of rheumatic fever. All 12 tracts (stippled) which had low rents, crowding, dense population, but no Negroes (less than 6 per cent), also had a significant level of rheumatic fever. We might therefore say that the Negro was no factor, if it were not for the 4 tracts which had only dense population and Negroes. These are indicated by diagonal lines (3 tracts), or "NA" (1 tract). Three of these tracts had a significant incidence of rheumatic fever. This is consistent with the picture of rheumatic infections in Cincinnati as reported in previous papers.[12, 13] The Negro had a higher incidence and a more severe form of this disease than

TABLE 2

Distribution by Census Tracts of 517 Cases of Rheumatic Fever Admitted to Cincinnati Hospitals During 1930–1940, in Relation to Rentals, Crowding, Density of Population, and Negro Population*

Characteristics of Census Tracts	Annual Cases Rheumatic Fever per 100,000 Population in Each Census Tract: 10 Cases or More (C. T.)	Annual Cases Rheumatic Fever per 100,000 Population in Each Census Tract: Less than 10 Cases (C. T.)	(N=1) X^2
1. Rental less than $21.65 monthly	25	1	
Rental $21.65 or more	8	69	61.8
2. Crowding 11 per cent or more	25	6	
Crowding less than 11 per cent	8	64	45.0
3. Persons per acre 23 or more	30	19	
Persons per acre less than 23	3	51	34.1
4. Negroes 6 per cent or more	16	6	
Negroes less than 6 per cent	17	64	19.0
5. Negroes 15 per cent or more	12	2	
Negroes less than 15 per cent	21	68	18.7
Rental less than $21.65 Crowding 11 per cent or more *(Omit Persons per acre and Negroes)*	24	1	58.9
6. Rental $21.65 or more Crowding less than 11 per cent *(Omit Persons per acre and Negroes)*	7	64	
Census Tracts not assignable above	(2)	(5)	
Crowding 11 per cent or more Persons per acre 23 or more *(Omit Rentals and Negroes)*	24	2	54.5
7. Crowding less than 11 per cent Persons per acre less than 23 *(Omit Rentals and Negroes)*	2	47	
Census Tracts not assignable above	(7)	(21)	

* 103 Census tracts after omission of C. T. 24, 32, 59, 85 (see text).

the white. Whether this is the result of racial susceptibility or of a different pattern of living cannot be determined exactly.

Table 2 summarizes the statistical relationship between the annual incidence of rheumatic fever and rentals, etc. The selection of (1) $21.65 rental, (2) 11 per cent crowding, (3) 23 persons per acre, and (4) 6 per cent Negroes, was made after a trial and error method had determined that these limits gave the best correlation with the presence or absence of a significant amount of rheumatic fever. Such selection is necessary because the rental value of any one type of housing will vary in different cities and nations. Likewise the level at which crowding, density of population, or Negro population becomes important will vary somewhat in different cities depending upon other factors such as climate and living habits. The limit of 10 annual cases of rheumatic fever per 100,000 population was also used by Hedley.[10]

It is evident that the order of importance is: (1) rentals, (2) crowding, (3) density of population, and (4) Negroes. For instance, there were 77 census tracts each of whose median monthly rental was over $21.65. Only 8 of these areas had an appreciable incidence of rheumatic fever. Of 26 tracts with rental under $21.65, 25 had a marked incidence of rheumatic fever.

According to the chi squared test, where $N = 1$, a X^2 between 3.5 and 4.0 means that the association could occur by chance alone 5 times in 100. Any larger X^2 is considered significant. For example, if the association of rentals and rheumatic fever yielded a X^2 of 10, with $N = 1$, the association could occur

by chance only 16 times in 10,000. Actually the X^2 in this instance was 61.8. All the associations in Table 2 show a high degree of significance.

Earlier in this article it was stated that C. T. 32, 59, 85, and 24 had been omitted. Inclusion of these 4 tracts in Table 2 would not seriously alter the significance of the data. In Table 2 the chi square for rentals would be changed from 61.8 to 52.7 and the other chi squares would become, reading downward in the table: 37.7, 32.9, 14.9, 17.0, 49.8, and 49.3.

SUMMARY AND COMMENT

This survey again emphasizes the importance of poverty and crowding in the genesis of rheumatic fever. However, poverty and crowding are only signposts pointing to a more fundamental epidemiological principle. It is instructive to compare the information gained by such surveys as this with what is now known about rheumatic infections in military camps in the United States. There is a comparatively high incidence of rheumatic fever in the military forces in Colorado, Idaho, and Utah. These camps are in dry * areas, removed from water courses, and at relatively high altitudes. Needless to say, poverty is no factor, and the housing, sanitation, and diet are excellent. In fact, there are only two features common both to the military forces in these states and to the impoverished civilians in areas with a high incidence of rheumatic fever, namely (1) crowding, and (2) inability to control the microclimate. It is not always possible for either the poor man or the military man to rest whenever he is tired, get warm when he is cold, and keep dry when it is raining. In civilian life, poverty, diet, proximity to water courses, etc., might be said to be important only in so far as they are a part of the two features mentioned, and so reduce the power of the body to resist disease.

* Annual inches rainfall: Colorado 16, Idaho 18, Utah 13.

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Salmonella Isolated in Florida During 1943 with the Combined Enrichment Method of Kauffmann

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NUMEROUS enrichment methods for fecal bacteriology have been described in the literature, and we shall not attempt to enumerate them. It is well known that a suitable selective enrichment is essential for the isolation of enteric pathogens from feces.

A tetrathionate broth for enrichment of typhoid and paratyphoid bacilli was first used successfully in 1923 by Mueller,[1] who showed that it inhibited coliform organisms and allowed typhoid and paratyphoid bacilli to grow profusely. Kauffmann, 1930,[2] described the combined enrichment method for *Salmonella*, which consisted of the original tetrathionate broth of Mueller plus 5 per cent bile and brilliant green 1:100,000 used in combination with Kauffmann's modification of the brilliant green-phenol red agar of Kristensen, Lester, and Jurgens.[3] In 1935, Kauffmann,[4] reported the results of 10,182 feces examinations made by this method in which an increase in *Salmonella* isolations of 700 per cent over previous findings was obtained. In typhoid isolations an increase of 30–40 per cent was noted, and in dysentery isolations an increase of 10–20 per cent. As a result of his experiences he recommends for the examination of pathogenic intestinal bacteria, in addition to the direct streak method, the routine use of the combined enrichment method.

Extensive investigations with this method have been reported by many European workers,[5] by Hormaeche and Peluffo[6] in Montevideo, by Varela[7] in Mexico, and by others with equally favorable results. It was highly recommended to us by Dr. P. R. Edwards, Kentucky Agricultural Experiment Station in Lexington, Ky., who has also confirmed its efficacy. Since it has not, to our knowledge, been used routinely in public health laboratories in this country, the following results are reported to confirm its usefulness.

From March 15, 1943, to January 1, 1944, 8,093 feces specimens have been examined in the central laboratory of the Florida State Board of Health at Jacksonville by the combined enrichment method of Kauffmann, and by direct streaking. A large percentage of these specimens were received from normal food handlers, the remainder were from suspected cases and contacts of enteric infections.

PROCEDURE

Specimens were received in 1 oz. screw-capped bottles containing 10 to 15 ml. of glycerine-saline preservative. A portion of the specimen was streaked directly onto a Wilson-Blair bismuth sulfite agar (WB) plate and an SS agar (Difco) plate. About ½ ml. was placed in tetrathionate-brilliant green

bile enrichment broth. After 16–18 hours' incubation at 37° C. a large loopful of the tetrathionate broth was streaked to a brilliant green agar (BG) plate and also to an SS agar plate as the BG is not favorable for the growth of *Shigella*. Typical or suspicious colonies were picked to Kligler's iron agar (Difco) with 1 per cent sucrose added, and the procedure for identification already described by Galton and A. L. Quan [8] was followed.

The tetrathionate broth and brilliant green agar were prepared according to the formulae of Kauffmann [4] as follows:

Tetrathionate broth—Enrichment medium

A. 90 ml. sterile infusion broth—pH 7.4
5 gm. sterile $CaCo_3$ (precipitated chalk)
10 ml. sterile 50% solution $Na_2S_2O_3$
Sterilize in autoclave
Add 2 ml. unheated solution I + KI
(20 gm. I + 25 gm. KI + 100 ml. H_2O)

B. To 100 ml. of tetrathionate broth add 1 ml. brilliant green solution (1 to 1,000)

C. Sterile beef bile 5%
(5% of a 10% solution of dehydrated oxgall, Difco, was used as fresh bile was difficult to obtain)

The $CaCO_3$ is evenly suspended by continued shaking of the mixtures.

The medium is dispensed into sterile tubes with a sterile pipette in 7–8 ml. amounts. It will keep for some time and is not further heated. We usually prepare 2 or 3 liters at one time.

Brilliant Green Agar (Kristensen, Lester, and Jurgens, modified by Kauffmann)

	Per cent	
Meat extract	0.5	
Peptone (Difco)	1.0	
NaCl	0.5	
Lactose	1.0	
Sucrose	1.0	
Phenol red solution	4.0	(40 ml. N/10 NaOH + 460 ml. H_2O + 1 gm. phenol red)
Brilliant green solution (0.5%)	2.5 ml.	per liter
Agar	2	%

Sterilize in autoclave. Reaction should be pH 7.2 — 7.4.

We have found it satisfactory to pour a sufficient number of brilliant green agar plates for 2 or 3 days if they are kept in the refrigerator until used.

RESULTS

The number and per cent of *Salmonella*, typhoid and dysentery isolations obtained by the combined enrichment method and by direct streaking are shown in Table 1.

For several years, prior to the time we adopted the combined enrichment method, Selenite F enrichment, together with direct streaking to SS or DC and WB plates, was used routinely in our laboratory. The results with this method during 1942 and until March 15, 1943, are shown in Table 2 for comparison. Due to the decided decrease in the percentage of positive typhoid cultures with the combined enrichment method, we have given the results obtained with Selenite F in 1941 in Table 3, to show the much greater decrease that occurred in positive typhoid cultures before the change in methods was made. We may also add that the percentage of typhoid isolations in our blood-clot cultures has decreased from 2.07 per cent in 1941 to 0.007 per cent in 1943. The majority of our positive typhoid feces cultures come at present from repeated check specimens on the 18 to 20 known carriers in the state. In spite of this fact, Selenite F was superior to the combined method for the enrichment of *Eberthella typhosa*. We believe better results could be obtained if the tetrathionate broth were also inoculated onto WB agar, as this is, apparently, the most favorable plating medium for the typhoid bacillus.

It may be seen from the results of these examinations that our percentage of positive dysentery isolations has remained almost constant during the 3 year period. We have not, as yet, found the tetrathionate-brilliant green bile broth particularly conducive to the

TABLE 1

Positive Results from the Examination of 8,093 Feces Specimens by the Direct Streak Method and Combined Enrichment Method of Kauffmann

(1943)

	Direct Streak		Tetrathionate Broth			
Isolations	*SS*	*WB*	*SS*	*BG*	*Total Positive*	*Per cent Positive*
Salmonella	17	42	74	85	107	1.32
Typhoid	36	76	42	8	79	0.97
Dysentery	77	1	10	1	84	1.03

TABLE 2

Positive Results from the Examination of 3,888 Feces Specimens by the Direct Streak Method and Selenite F Enrichment

(1942–1943)

	Direct Streak		Selenite F		
Isolations	*SS or DC*	*WB*	*DC*	*Total Positive*	*Per cent Positive*
Salmonella	9	11	17	22	0.5
Typhoid	49	87	91	110	2.82
Dysentery	50	8	12	54	1.38

TABLE 3

Positive Results from the Examination of 2,096 Feces Specimens by the Direct Streak Method and Selenite F Enrichment

(1941)

	Direct Streak		Selenite F		
Isolations	*SS or DC*	*WB*	*DC*	*Total Positive*	*Per cent Positive*
Salmonella	5	4	12	14	0.6
Typhoid	46	78	123	141	6.7
Dysentery	40	0	15	40	1.8

growth of *Shigella*. Kauffmann, however, recommends inoculating the tetrathionate broth to plates after 5 and 16 hours' incubation for best results with *Shigella*. In our work we have been able to streak only after 16 hours' incubation, which probably accounts for our failure.

The results in these tables clearly demonstrate that with the combined method (Table 1), our *Salmonella* isolations have more than doubled those obtained through Selenite F enrichment. It is also significant that 20 cultures were isolated from the brilliant green agar alone. From our experience this method is far superior to Selenite F and direct streak methods for the isolation of *Salmonella*. Although the tetrathionate broth is rather time consuming to prepare, it is well worth the effort. Coliforms are inhibited to such an extent that frequently no growth at all appears on the BG and SS agar plates in negative cultures. *Salmonella* grow readily on BG agar. The colonies are pink or red (when appearing in pure culture), circular, convex and transparent, with even borders. *Pseudomonas aeruginosa* also develops well on this medium, but the colonies can be recognized usually by their flatness, irregular borders and purplish red color. *Alcaligenes* produces red colonies which are raised and slightly opaque. The lactose and sucrose fermenting organisms which grow on BG agar produce opaque, raised colonies, yellowish green in color. We have observed comparatively few BG agar plates on which

pink colonies were found to be slow lactose or sucrose fermenters instead of *Salmonella,* thus the picking of colonies is reduced to a minimum.

Since our results with the combined method were so favorable we began using it in our Miami branch laboratory, late last year. Reports from W. H. Miller help to confirm our opinion of its value. In 2½ months 324 feces specimens were examined and 10 *Salmonella* isolated. During the first 9½ months of 1943, 472 specimens were examined with the Selenite F enrichment broth and no *Salmonella* were found.

TYPES

During the 9½ months that we have used the combined method, 107 strains of 27 types of *Salmonella* have been isolated from 89 persons, both normal carriers and cases, as shown in Table 4.

It is notable that more cultures of *S. meleagridis* were isolated than of any other type. Strangely enough, 12 of the 14 cultures of this species were isolated from food handlers in the same community over a period of 6 weeks. It was found that the persons harboring this unusual type were not ill and that they were employed in the same canning establishment. An investigation by the county health officer has failed to reveal the source of infection. Of the other two cultures, one was obtained from a 5 year old child with enteritis, and one from a food handler. These persons lived in different sections of the state.

One new *Salmonella* type was found, which has been described by Edwards.[9]

TABLE 4

Types Isolated from Feces of 89 Patients

Types of Salmonella	*Group*	*Number Isolated*	*Case*	*Normal*		*History Unknown*
				Non-F.H. *	*F.H.*	
bredeney	A-B	4	..	..	3	1
paratyphi B	"	1	..	..	1	..
paratyphi var. Java	"	3	1 [b]	2 [a]	..	..
derby	"	5	1	..	3	1
san diego	"	2	1	..	1	..
typhimurium	"	5	2	..	1	1
typhimurium var. copenhagen	"	2	2 [c]	..	..	..
bareilly	C	3	..	1	2	..
hartford	"	1	1	..	..	..
litchfield	"	2	..	..	2	..
montevideo	"	8	2	1	3	..
newport	"	9	3	..	3	..
oranienburg	"	11	4 [d]	1	3	1
oregon	"	4	..	..	3	..
sendai	D	4	2	..	1	..
anatum	E	10	2	1	6	1
give	"	5	2	..	2	..
meleagridis	"	14	1	..	12 [e]	..
newington	"	4	1 [f]	..	1	..
senftenberg	"	1	..	..	1	..
carrau	Further groups	1	..	..	1	..
coli	" "	1	..	1	..	..
florida	" "	2	..	..	2	..
gaminara	" "	1	..	..	..	1
inverness	" "	1	..	..	1	..
madelia	" "	2	..	..	2	..
rubislaw	" "	1	..	..	..	1

* F.H.=food handler

[a] One culture isolated from feces of a normal spider monkey.

[b] *S. coli* was isolated from this patient 2 months later. Subsequent specimens failed to reveal either type.

[c] Isolated from feces of two sick pigeons.

[d] *E. typhosa* also isolated from the same specimen in one case which proved fatal.

[e] Flexner dysentery bacilli isolated from same specimen of one food handler.

[f] Sonne dysentery bacilli isolated from patient 1 month later. Neither organism was found in subsequent specimens.

He has given it the name of *S. inverness*.

The occurrence of more than one type in the same person was noted once. *S. anatum* and *S. bredeney* were isolated from an apparently normal Negress, a food handler, 27 years old. Mixed infections were encountered twice. *Salmonella oranienburg* and *Eberthella typhosa* were isolated simultaneously from a fatal infection. *S. meleagridis* and *Shigella dysenteriae* (Flexner) were obtained from the same feces specimen of a normal food handler, whose history failed to reveal previous enteric disturbance.

Approximately two-thirds of the *Salmonella* isolations were obtained from normal persons, 54 being food handlers and 6 not food handlers. A detailed questionnaire was sent to the physician in charge of each person from whom specimens were obtained, when each culture was isolated. Data have been received regarding 46 of the 60 normal carriers. The information so obtained has not revealed a single instance in which an intestinal disturbance was noted prior to isolating a pathogenic organism. This indicates that the occurrence of *Salmonella* in the the stools of apparently healthy persons is not uncommon in this region.

CONCLUSIONS

In our hands, the combined enrichment method of Kauffmann has proved to be excellent for the isolation of *Salmonella* from routine feces specimens. We attribute our 164 per cent increase in positive *Salmonella* finding to the efficacy of this medium.

It did not prove as favorable for the isolation of typhoid and *Shigella*. However, with the inclusion of the following measures in our present method, more satisfactory results could, no doubt, be obtained: (1) Inoculation of tetrathionate broth after 16 hours' incubation to a WB agar plate. (2) Inoculation of tetrathionate broth after 5 hours' incubation to an SS agar plate.

We have continued to find in Florida, a wide variety of *Salmonella* types, including all of the antigenic groups. It is possible that this occurrence is due in part to the large numbers of transient persons continually moving into and out of the state from many points of the globe.

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ACKNOWLEDGMENT: The writers wish to express their appreciation to Miss Pearl Griffith, Acting Director of Laboratories, for her interest and suggestion in the preparation of this report, and to Dr. P. R. Edwards, Department of Animal Pathology, Kentucky Agricultural Experiment Station, Lexington, Ky., for identifying the cultures and reviewing the manuscript.

Epidemiological Study of Lymphogranuloma Venereum, Employing the Complement-Fixation Test

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IMMUNOLOGICAL evidence of infection with the virus of lymphogranuloma venereum is frequently encountered in persons who show no sign of the clinical disease. This brings up certain problems, such as the actual prevalence of the infection, the duration of the immune reaction, and the possibility that infection can be acquired either *in utero* or through portals other than the genital tract. Some information on these problems can be had by studying groups of people for evidence of infection. While the Frei test for lymphogranuloma has been carried out on a considerable number of people as a part of the routine work-up in many venereal disease clinics, the results obtained have provided little information on the population as a whole. With the exception of a study in Puerto Rico, by Morales and Carrera,[1] there has been no systematic application of the Frei test to a study of the epidemiology of the disease. As a survey method it is somewhat cumbersome, because it necessitates two visits with each person tested. When Rake and his associates developed a simple complement-fixation test for lymphogranuloma venereum, a method was provided which was more readily applied to epidemiological investigations. The present report is chiefly an analysis of the results of a series of complement-fixation tests done on white and Negro clinic patients at Grady Hospital, Atlanta. It includes, in addition, the results of tests on the sera of new-born infants and their mothers, from the Colored Obstetrical Service of the same hospital.

METHODS AND MATERIAL

Kahn Test for Syphilis—The data in this article refer to the results obtained using the Standard Kahn Test, performed in the Grady Hospital laboratories.

Complement-Fixation Test for Lymphogranuloma Venereum — The technic employed was exactly the same as that outlined by McKee, Rake, and Shaffer.[2] The antigen used was the commercial preparation, Lygranum C. F. (Squibb). Known positive and negative sera were included as controls in each group of tests. Each serum was diluted 1–5 and 1–20 before mixing with the other components, giving final dilutions of 1–25 and 1–100. These were set up against normal yolk sac material, as well as the infected yolk sac material. The result was interpreted as positive if there was complete or almost complete fixation with

either dilution of serum in the presence of the infected yolk material. No case was encountered in which there was a prozone giving fixation with the higher serum dilution and not with the lower.

The complement-fixation test could not be interpreted in 34 of the 879 sera received from the out-patient clinics. In 7 of them the difficulty was anti-complementary action of the serum. In the remaining 27 there was fixation of complement in the presence of normal yolk sac control material. This reaction has been noted occasionally since the test first began to be used.[3] It is found almost exclusively in the sera of persons with syphilis. In the present study 24 of the 27 sera which showed it gave positive Kahn reactions. Two of the others were from young women with chronic pelvic inflammatory disease, and the third was from a young man who gave a history of chancre 3 years previously, and who had received 7 intravenous treatments immediately after he had developed the chancre. There were 14 males and 13 females in this group. Twenty-six of them were Negroes. The ages of the 27 patients were distributed fairly uniformly throughout all periods of life, including 2 infants with congenital syphilis and 4 persons who were more than 55 years of age.

Clinical Material—For the studies of the age and sex incidence 879 sera were received from persons attending the various out-patient clinics of the hos-

TABLE 1

Incidence of Positive Serologic Tests for Lymphogranuloma Venereum and Syphilis in Colored Females, According to Age

Age Group	Lymphogranuloma Venereum Complement-Fixation			Kahn		
	Number Tested	Number Positive	Per cent Positive	Number Tested	Number Positive	Per cent Positive
0– 4	24	1	4.2	21	2	9.5
5– 9	12	1	8.3	12	1	8.3
10–14	17	3	17.6	16	2	12.5
15–24	58	23	39.7	57	15	26.3
25–34	64	27	42.2	63	24	38.1
35–44	37	16	43.3	37	13	35.1
45–54	27	9	33.3	27	9	33.3
55+	23	8	34.8	22	6	27.3
Total	262 *	88	33 6	255 *	72	28.2

* No Kahn test on 7 patients

TABLE 2

Incidence of Positive Serologic Tests for Lymphogranuloma Venereum and Syphilis in Colored Males, According to Age

Age Group	Lymphogranuloma Venereum Complement-Fixation			Kahn		
	Number Tested	Number Positive	Per cent Positive	Number Tested	Number Positive	Per cent Positive
0– 4	29	0	0	25	0	0
5– 9	16	1	6 2	16	2	12.5
10–14	18	0	0	18	1	5.6
15–24	33	9	27.3	31	7	22.6
25–34	43	22	51 2	39	14	35.9
35–44	29	14	48.2	26	9	34.6
45–54	30	14	46.7	29	14	48.3
55+	37	18	48.6	34	7	20.6
Total	235 *	78	33 2	218 *	54	24.8

* No Kahn test on 17 patients

pital between November, 1942, and May, 1943. The sera were usually obtained in the course of a bleeding for a Kahn test. Since it is more or less routine to test all new clinic patients for evidence of syphilis, whatever their illness, these sera may be considered as being from an unselected group of clinic patients. Unfortunately, the clinical data obtainable from the records were often so brief, because of the minor nature of the illnesses, that it was not feasible to attempt a correlation between the results of the serologic test for lymphogranuloma and history of other evidence of this disease.

The number of white males tested was comparatively small, because many were either in military service or were in an economic bracket which made them ineligible for clinic care in a charity hospital.

RESULTS

In Tables 1 and 2 are shown the results of complement-fixation tests for lymphogranuloma venereum on the sera of 497 Negroes, arranged according to age. For comparison, the results of Kahn tests on the same persons are included in the tables. Positive tests for lymphogranuloma venereum were given by approximately 33 per cent of the entire group of colored males and females. The incidence of positive Kahn reactions was slightly lower, being 24.8 per cent for males and 28.8 per cent for females. When considered by age group it is observed that the proportion of positive tests for both diseases followed a somewhat similar pattern, being comparatively low in children under 15 years of age, but mounting rather sharply during the next decade, and then remaining at about the same level in succeeding age groups. If the data on children under 15 years of age are excluded, serologic evidence of lymphogranuloma venereum is found in 39.7 per cent of colored females and 44.8 per cent of colored males. The rates for positive Kahn tests then become 33.0 per cent and 32.1 per cent respectively.

The results of the same serologic tests on 348 white persons are presented in Tables 3 and 4. Evidence of lymphogranuloma venereum was given by 26 of 229 white females, an incidence of 11.4 per cent, and by 10 of 119 white males, an incidence of 8.4 per cent. The rates for positive Kahn tests in the same group were 7.1 per cent and 10.3 per cent respectively. Correction of these figures, by excluding data on children under 15 brings the lymphogranuloma incidence up to 12.1 per cent for females and 11.6 per cent for males, while the percentage of sera giving positive Kahn tests becomes 6.9 and 14.7 respectively. Because of the small number of white children in the present series, the results obtained in persons over 14 years of age are undoubtedly a better basis for comparison of prevalence of these diseases in the white and Negro clinic patients.

In view of the similarities in the results of serologic tests for syphilis and lymphogranuloma and since it has been claimed that persons with syphilis may give false positive complement-fixation reactions for lymphogranuloma,[4] it seemed advisable to determine the frequency with which positive tests for both diseases had occurred in single individuals. The results of this analysis are given in Tables 5, 6, 7, and 8. These show that the similarity in incidence of positive tests for syphilis and lymphogranuloma was not due to the fact that positive tests for both diseases were largely given by the same persons. Actually the number of persons giving a positive test for one disease and a negative test for the other was in all groups considerably larger than the number of persons giving positive tests for both diseases. An additional point in this connection is the

TABLE 3

Incidence of Positive Serologic Tests for Lymphogranuloma Venereum and Syphilis in White Females, According to Age

Age Group	Lymphogranuloma Venereum Complement-Fixation			Kahn		
	Number Tested	Number Positive	Per cent Positive	Number Tested	Number Positive	Per cent Positive
0– 4	4	0	0	4	0	0
5– 9	3	0	0	3	1	33.3
10–14	16	1	6.2	16	1	6.2
15–24	58	6	10.2	45	2	4.4
25–34	41	4	9.8	29	3	10.3
35–44	36	5	13.9	33	2	6.1
45–54	23	5	21.7	23	3	13.0
55+	48	5	10.4	45	2	4.4
Total	229 *	26	11.4	198 *	14	7.1

* No Kahn test on 31 patients

TABLE 4

Incidence of Positive Serologic Tests for Lymphogranuloma Venereum and Syphilis in White Males, According to Age

Age Group	Lymphogranuloma Venereum Complement-Fixation			Kahn		
	Number Tested	Number Positive	Per cent Positive	Number Tested	Number Positive	Per cent Positive
4– 4	7	0	0	7	0	0
5– 9	9	0	0	9	0	0
10–14	19	0	0	16	0	0
15–24	9	0	0	9	1	11.1
25–34	13	2	15.4	12	0	0
35–44	12	2	16.7	12	4	33.3
45–54	16	2	12.5	15	2	13.3
55+	34	4	11.8	27	4	14.8
Total	119 *	10	8.4	107 *	11	10.3

* No Kahn test on 12 patients

different correlation between the two tests in the white and Negro patients. While 60 per cent of both Negro males and females with positive Kahn had positive lymphogranuloma fixation, only 18 and 21 per cent of the white males and females with syphilis gave this reaction. If syphilis were a frequent cause of false positive tests for lymphogranuloma, one would not expect this racial difference.

An investigation of the complement-fixation reaction in new-born Negro infants was carried out by testing 37 infants and their mothers. It was found that in every case the result in the infant was essentially the same as that of its mother. In 23 of the 37 cases the test was negative in both, while in the remaining 14 the result was positive in both. Furthermore, in the positive cases the titers in infant and mother agreed closely. Follow-up tests were obtained from 2 to 4 months later on 9 of the 14 infants who had given a positive test at birth. These were all found to be negative at the time of the second examination.

After this investigation of new-borns had been completed, a similar study, done at Harlem Hospital, New York City, was published by Levine, Bullowa, and Scheinblum.[5] Their findings were similar to ours.

TABLE 5

Frequency With Which Positive Kahn and Positive Lymphogranuloma Venereum Fixation Tests Were Associated
Colored Females, According to Age

Age Group	Kahn+ L.V.C.F.+	Kahn+ L.V.C.F.−	Kahn− L.V.C.F.+	Kahn− L.V.C.F.−
0– 4	..	2	1	18
5– 9	..	1	1	10
10–14	1	1	2	11
15–24	12	3	9	33
25–34	15	9	12	27
35–44	9	4	7	17
45–54	3	6	6	12
55+	3	3	4	13
Total	43	29	42	141

L.V.C.F.=Lymphogranuloma venereum complement-fixation

TABLE 6

Frequency With Which Positive Kahn and Positive Lymphogranuloma Venereum Fixation Tests Were Associated
Colored Males, According to Age

Age Group	Kahn+ L.V.C.F.+	Kahn+ L.V.C.F.−	Kahn− L.V.C.F.+	Kahn− L.V.C.F.−
0– 4	..	..	..	24
5– 9	..	2	1	13
10–14	..	1	..	17
15–24	3	4	6	19
25–34	8	6	13	12
35–44	9	..	5	12
45–54	9	5	5	10
55+	3	4	14	13
Total	32	22	44	120

L.V.C.F.=Lymphogranuloma venereum complement-fixation

TABLE 7

Frequency With Which Positive Kahn and Positive Lymphogranuloma Venereum Fixation Tests Were Associated
White Females, According to Age

Age Group	Kahn+ L.V.C.F.+	Kahn+ L.V.C.F.−	Kahn− L.V.C.F.+	Kahn− L.V.C.F.−
0– 4	..	..	..	4
5– 9	..	1	..	2
10–14	..	1	1	14
15–24	..	2	4	39
25–34	1	2	..	26
35–44	..	2	5	26
45–54	..	3	5	15
55+	2	..	2	41
Total	3	11	17	167

L.V.C.F.=Lymphogranuloma venereum complement-fixation

TABLE 8

Frequency With Which Positive Kahn and Positive Lymphogranuloma Venereum Fixation Tests Were Associated
White Males, According to Age

Age Group	Kahn+ L.V.C.F.+	Kahn+ L.V.C.F.−	Kahn− L.V.C.F.+	Kahn− L.V.C.F.−
0– 4	..	..	..	7
5– 9	..	..	..	9
10–14	..	..	..	16
15–24	..	1	..	8
25–34	..	..	2	10
35–44	1	3	1	7
45–54	..	2	2	11
55+	1	3	..	23
Total	2	9	5	91

L.V.C.F.=Lymphogranuloma venereum complement-fixation

DISCUSSION

There are two possibilities of error in the interpretation of the complement-fixation test for lymphogranuloma venereum. The first is that the test does not differentiate between antibodies for the agent of lymphogranuloma venereum and other viruses in the lymphogranuloma-psittacosis group.[6, 7] However, so far as is known at present, none of the other members of this group causes infections in human beings in anything like the frequency found in the present study. Furthermore, none of the others is known to exhibit the special affinities for race and age group which were found in this work. A second difficulty is the possibility that persons with other diseases may give false positive complement-fixation tests for lymphogranuloma venereum. Knott and his associates state that the specificity of the test is challenged by "the large number of positive reactions found in the sera of patients giving no history and presenting no clinical signs of the disease and also by the possible cross-reactivity with other venereal diseases, particularly syphilis."[4] Their first objection is not very persuasive, since there is abundant evidence that many specific infections occur without inducing obvious disease. These workers do, however, cite some observations

on their own patients which indicate that a false positive complement-fixation reaction for lymphogranuloma venereum may occasionally occur in syphilitic individuals. On the other hand, Rake and his associates have furnished evidence that false positive complement-fixation tests for lymphogranuloma venereum due to syphilis are at least very rare.[8, 9] The fact that immunological evidence of lymphogranuloma venereum is so common in individuals with venereal infections other than syphilis also appears to be significant. It would be surprising indeed if infection not only with the spirochete of syphilis, but also with the gonococcus and with the Ducrey bacillus were capable of giving rise to false positive serological evidence of this virus disease. We think it probable that the high incidence of positive tests for lymphogranuloma in individuals with syphilis and other venereal diseases is due to actual associated lymphogranuloma infection, even in the absence of clinical signs.

The findings in the present studies afford little evidence of congenital transmission of lymphogranuloma venereum. Although antibodies were found in the sera of some new-born Negro infants, they were probably the result of passive transfer from the mothers, since they had disappeared by the time the infants reached 4 months of age. The few positive tests which were obtained in older children may have been caused by acquired lymphogranuloma venereum infection or by infection with some other member of the lymphogranuloma-psittacosis group. Acquired lymphogranuloma venereum in children is not very rare; it may result from the use of contaminated enema tips, from close contact with infected adults, or from venereal practices.[10]

It is of interest that positive tests for lymphogranuloma venereum were found almost as frequently in the older groups as in the age periods of greatest sexual activity. One might infer from this that the causative agent persists in the body throughout the life of the host, providing an ever-present antigenic stimulus.

SUMMARY

Complement-fixation tests for lymphogranuloma venereum were done on 879 hospital clinic patients, and the results were analyzed according to race, age, and sex. Approximately 40 per cent of adult Negroes and 12 per cent of adult white persons gave positive reactions. There were only 6 positive reactions among 116 Negro children under the age of 14 years, and only 1 positive reaction among 58 white children in the same age group. A sharp rise in incidence occurred after the age of 14 years. This is believed to be due to acquired venereal infection. The incidence of positive reactions was approximately the same in all age groups beyond the 4th decade. This persistence of an immune reaction in age groups where sexual contacts are less frequent suggests the possibility that the virus persists in the body, providing continued antigenic stimulus.

Comparisons were made of the complement-fixation reaction in new-born Negro infants and their mothers. It was found that immediately after birth the reaction in the infant's serum is the same as that of the mother. Nine infants who had given positive reactions were re-tested 2 to 4 months later; they had all become negative. It appears, therefore, that a positive test at birth is due merely to the passive transfer of antibodies from the mother.

The error introduced by the fact that infection with other members of the lymphogranuloma-psittacosis group of viruses will give rise to positive complement-fixation test for lymphogranuloma venereum cannot be assessed. It

is not likely, however, that the prevalence of infection by the other agents in this group is sufficiently great to distort markedly the picture of the prevalence of lymphogranuloma venereum.

A comparison was made of the results of the Kahn test and the results of the complement-fixation test for lymphogranuloma venereum. The incidence of positive Kahn reactions in the entire group was 32 per cent for adult Negroes and 9 per cent for adult white persons. The distribution of positive results according to age followed much the same pattern as had been the case with lymphogranuloma venereum. These similar findings appear to be compatible in view of the fact that both diseases are acquired by sexual contact. Reasons are given for the belief that false positive tests for lymphogranuloma venereum given by individuals with syphilis did not play an important part in producing the similarities.

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NOTE: The authors are indebted to Miss Med Scott Brown for technical assistance in this work.

New York State Caries-Fluorine Demonstration

The New York State Department of Health recently began the dental examinations of school children in Newburgh, N. Y., which, with the city of Kingston, N. Y., is collaborating in a long range demonstration to determine the practicability of mass protection against dental caries by adding fluorine to public drinking water supplies. Newburgh will be the study area and Kingston the control. Dental inspections of about 1,000 children aged 5 to 14 years will be made in each city. The purpose is to obtain at the outset of the demonstration a dental caries index which will serve as a basis of comparison with the terminal figures at the end of 10 years, the length of time which must elapse before the full benefits of the water treatment are realized. Included in the study will be a pediatric investigation of a representative sample of the child population, including a general physical examination, urine analysis, and x-ray films of the long bones and centers of ossification.

Serological Types of Hemolytic Streptococci Isolated from Multiple Cases of Scarlet Fever in the Same Households

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THE modern concept of the epidemiology of scarlet fever embraces both the case and the carrier as sources of the new case. The differentiation of hemolytic streptococci into serological types [1] led to the hope that the epidemiology of scarlet fever could be more clearly elucidated by relating the carrier to the case or the case to another case in a direct chain of epidemiologic circumstance. However, the finding that most of the serological types may be the cause of scarlet fever,[2] together with fluctuations in the prevalence of the various types in the same population groups with reference to time and space, have complicated, rather than clarified, the epidemiologic relationships involved. Although in clearly circumscribed outbreaks, one type is usually the predominant cause of disease,[3] the movement of a particular type is followed with difficulty in any sizable community. Indeed, endemic scarlet fever does not appear to be a function of any single serological type of hemolytic streptococcus; but rather a fluctuation in the incidence of several toxigenic types found among carriers in the population. Since the dissemination of the hemolytic streptococcus may be accomplished through individuals who present no recognizable symptoms, it is usually not possible to determine whether a given case represents the introduction of a new serological type; nor is it always possible to determine with certainty whether a given group of cases are related to one another in the epidemiologic sense.

The ideal situation for studying the relation between cases would be afforded by an outbreak of the disease following the single introduction of a single serological type of hemolytic streptococci into a previously uninfected community. Such an opportunity is rarely presented to the epidemiologist. Multiple cases in families present perhaps the nearest approach to a readily accessible grouping of epidemiologically related cases; except in those comparatively rare instances in which infection follows mass exposure to the same infectious agent through accidents of environmental hygiene.[4]

Chapin's classic studies [5] of familial aggregation in measles, diphtheria, and scarlet fever clarified the basic laws governing the dissemination of these

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NOTE: The opinions presented are those of the authors and do not necessarily reflect the policies of the Navy Department.

infectious agents. These agents, under conditions of exposure in a family, when introduced, tend to spread throughout the household. They cause high secondary attack rates among the susceptibles, and in the case of *Corynebacterium diphtheriae* and hemolytic streptococci, high carrier rates as well. Aycock and Eaton [6] in a study of Chapin's data, observed that secondary cases of scarlet fever, like those of measles, occur in two groups—(1) common source with, and (2) truly secondary to the first case in the family. They observed that 10 per cent of all secondary cases of scarlet fever occur more than 24 days removed from the first case, as contrasted with measles, where not more than 1½ per cent of the secondary cases occur so far removed from the initial case. The range within which secondary cases of scarlet fever occur appears to be due both to the variation in the incubation period and to the length of the period of infectivity; or possibly to the chance occurrence of another case in the same family. It seemed that the serological classification of hemolytic streptococci isolated from multiple cases of scarlet fever in the same household might establish bacteriological proof of the epidemiological relationship of the secondary case to the initial case in a given household; and at the same time, provide readily obtainable data concerning the spread of a single serological type in a previously uninfected group of epidemiologically related susceptibles.

During a 26 month period, throat cultures on 824 of 1,048 scarlet fever admissions to a contagious disease hospital in a local community * were examined for hemolytic streptococci. Of these, 598 were positive for Lancefield Group A hemolytic streptococci. These strains were classified as to serological type according to the slide agglutination method of Griffith.[1] (The totals include strains from a previously reported study.[7]) Thus, cultural and serological data are available on 57.1 per cent of all scarlet fever admissions during this period. Of the cases studied, 134 (22.4 per cent) occurred as multiple infections in 55 families. There were seven different serological types of hemolytic streptococci involved in these 55 households, and, as would be expected, the type isolated from multiple cases in a given household was the same in each instance. These data are summarized in Table 1.

TABLE 1

Serological Types of Hemolytic Streptococci Isolated from Multiple Cases of Scarlet Fever Occurring in the Same Households

Massachusetts Family Study	*No. Families with Multiple Cases of Each Type*	*Total Cases*
Griffith Types Isolated from Multiple Cases		
2	21	53
1	14	32
8	8	21
6	7	16
19 *	3	6
5	1	3
15	1	3
Total, seven serological types	55	134
Miscellaneous Families		
Griffith Types Isolated from Multiple Cases		
2	4	13
1	3	7
6	1	2
Total, seven serological types, all families	63	156

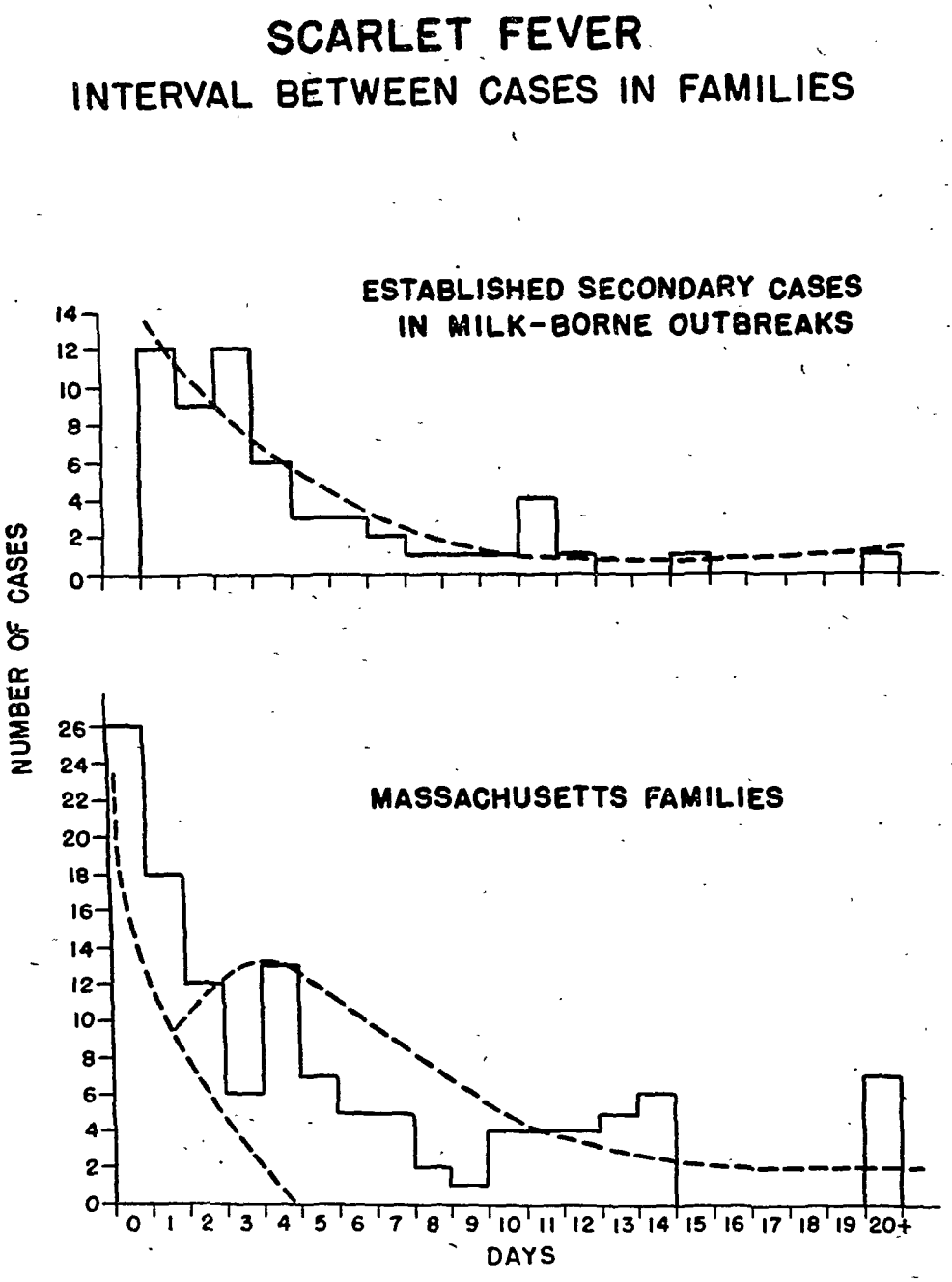
* Weak cross-reaction with types 4, 21, 26, 29.

All the various combinations of time intervals between the onset of cases in these families are plotted in Figure 1; together with data on 8 family outbreaks obtained from other sources,* and 57 cases secondary to primary

* The authors gratefully acknowledge the assistance of Dr. R. F. Feemster, Director of the Division of Communicable Diseases, Massachusetts Department of Public Health, Boston, Mass., for making arrangements to carry on this study.

* e.g., in a theoretical family, cases a, b, and c occur. Time intervals ab, ac, and bc are plotted.

FIGURE 1



common-source cases from other outbreaks,† a total of 213 cases in all. The broken lines in the lower graph represent an estimated division into common-source and secondary cases, assuming that the incubation period is most frequently between 3 and 4 days. The protracted course of family outbreaks of streptococcus infection is emphasized by the relatively high percentage of secondary cases which occurred 20 or more days following the original case or cases of scarlet fever in the given families. The maximum intervals between the primary and secondary case in the same household,

† From the data available for study, cases truly secondary to primary common-source cases could be established only on single secondary cases occurring in 57 families, hence the upper graph in Figure 1 shows only 57 intervals.

however, do not necessarily indicate the maximum duration of the convalescent carrier state.

It is evident in these studies then, that the occurrence of secondary cases of scarlet fever after a prolonged interval was not due to the chance introduction of a new infection into the same household, but was more likely the result of a spread through the family following the introduction of a single serological type of hemolytic streptococci. Such spread is not limited to case to case transfer, but includes non-scarlet and subclinical infection as well as intermediate carriers within the family. As pointed out by Gordon [2]:

> . . . infection with a streptococcus that produces erythrogenic toxin can lead to two kinds of clinical reaction. The result in a Dick negative subject—a host with antitoxic immunity—is a local infection, corresponding to sore throat or tonsillitis. A Dick positive subject, lacking antitoxic immunity, develops the complete syndrome of scarlet fever . . . Field studies . . . showed a well-marked frequency of coincident sore throat or upper respiratory infection among family contacts of patients with classic scarlet fever.

SUMMARY

Thus, family outbreaks in general, probably are single-source outbreaks caused by a single serological type of hemolytic streptococci, whereas on the other hand, scarlet fever in a sizable community appears to be caused by multiple types—perhaps due to the introduction of a number of strains from different sources. It may perhaps be postulated that endemic scarlet fever is composed of numerous outbreaks occurring in basic units of population such as the family, the whole of which gives the varied type-pattern characteristic of the disease in its endemic form. In other words, the epidemiology of endemic scarlet fever is complicated by the unavoidable multiplicity of human contacts, but in those circumstances where the movement of a particular serological type of hemolytic streptococci can be followed, person to person spread can be demonstrated.

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A Citrate Gold of Optimal and Reproducible Sensitivity for Use in the Colloidal Gold Reaction

Its Preparation and Control

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VARIOUS technics for preparing sols for use in the colloidal gold reaction have been proposed in the literature as modifications of the original technic,[1] in which formol was employed for the reduction of the gold chloride. The preparation of this original gold sol seemed too difficult for the average clinical laboratory. It was easy to find numerous other reducing agents, which apparently eliminated the difficulties and obviated the occasional failures of the formol method. The fundamental factors governing the results of the gold reaction were, however, in the beginning, entirely unknown. On the basis of present knowledge, it seems quite evident that every modification is bound to yield results inferior to those of the original technic, if the following fundamental factors are neglected: (1) the pH of the milieu, which has an optimum value of 7.4; (2) sensitivity of the gold sol, adapted to this required pH of the milieu; (3) aging of the gold sol.

Most of the modifications represented a deterioration of technic erroneously ascribed to the original gold reaction, and led to considerable discredit of the test. The quantitative gold reaction,[2] on the other hand, has twofold advantages. First, it meets the fundamental requirements to which reference has been made even better than the original method. Second, it meets the demand for an easy technic; the method is even simpler to perform than the description of it would indicate.

THE REPLACEMENT OF FORMOL GOLD BY A CITRATE GOLD OF SIMILAR SENSITIVITY

The preparation of gold sols for the gold reaction through the use of sodium citrate in the reduction of gold chloride was introduced by Borowskaja.[3] She employs the gold sol obtained with a citrate concentration of 1:2,000; for convenience, it may be referred to as "citrate gold 1:2,000." A peculiar advantage of the citrate reduction consists in the fact that no strict adjustment of the reduction pH is required, provided it is acid. It is to be noted that this reduction pH may be quite different from the optimal pH of the milieu in the test itself, which is fixed at pH 7.4. In the formol method, on the other hand, unless reduction occurs within a narrow range, slightly above pH 7.0, proper dispersion of the particles in the sol does not occur. The pH of citrate gold 1:2,000 is about 5.8–6.0, deter-

mined by the potentiometer, i.e., much lower than that of formol gold. This acid gold sol is orange-red in color and of high transparency, which indicates a very small particle size and therefore much lower sensitivity than formol gold. Aside from the changes induced by aging, the sensitivity of a gold sol depends, first, on the size of the particles, and second, on the pH of the milieu. In order to obtain correct curves in the gold reaction, the pH must be approximately 7.4 [2]; an orange-red gold sol of small particle size exhibits an unsatisfactory sensitivity at this pH. On the other hand, if the sensitivity is raised, as it is done in Borowskaja's modification by using a pH much below 7.4, false paretic curves are bound to occur in conditions such as purulent meningitis. Therefore, citrate gold 1:2,000 is not satisfactory to replace formol gold.

Sodium citrate or tartrate as reducing agents exhibit additional advantages not considered by Borowskaja and which may be utilized without any interference from an unsatisfactory pH of the milieu. Stable gold sols of widely varying but definite particle size may be obtained by keeping the concentration of the acid gold chloride constant, at 1:10,000, while varying the citrate concentration from 1:1,000 to about 1:15,000. In such a series of sols, the color and particle size vary progressively; the sol with the smallest particle size is orange-red in color and has the highest transparency. Those of larger particle size are burgundy-red, violet, and finally blue. The size of the particles in blue gold sols is so large that the sol is unstable. When the pH of the milieu in the test is 7.4, citrate gold 1:10,000, quite different from citrate gold 1:2,000, has about the same sensitivity as formol gold. It is much softer and more acid than citrate gold 1:2,000; its pH lies around 4.8–5.0. To use the sol in the test, its acidity must be neutralized, by employing strong buffers of pH 7.4 as diluent instead of saline.

PRESCRIPTION FOR THE PREPARATION OF REPRODUCIBLE CITRATE GOLD 1:10,000

For the preparation of citrate gold sols 1:10,000, relatively pure distilled water is used. The requirements of purity, however, are far less severe than in the formol method, since a single distillation is sufficient. In this laboratory, untreated spring water is rendered definitely alkaline and then treated with permanganate in sufficient amount so that some color remains after storage for 1 week in sunlight. Actually any source is satisfactory if the water, after a single distillation, yields satisfactory gold sols. The water is then distilled once in Pyrex stills of 5 liter capacity (Scientific Glass Apparatus Company, No. J-1333 Yoe distilling apparatus, interjoint, Pyrex glass). After generous steaming, a first run of about 500 ml. is discarded. The pure distilled water is collected in Pyrex Erlenmeyer flasks which are cleaned from time to time by steaming. All glassware is scrupulously cleaned and is used for no other purpose. The original source of the water is satisfactory if a single distillation yields a pure distilled water with which hardly any failures occur in the preparation of citrate gold 1:10,000. As a rule, the water is distilled one day before the preparation of the gold sol.

The acid gold chloride at present used in this laboratory is " Baker's purified." Gold chloride has an inconstant water content, with a resulting variability in the gold content. Nevertheless, in preparing the gold sol for use in a quantitative gold reaction, the complete contents of six vials may be satisfactorily dissolved in pure distilled water. Each vial contains 15 grains, equivalent to 0.97 grams. The gold chloride is dissolved in pure dis-

tilled water up to a volume of 400 ml., yielding a stock solution of almost 1.5 per cent. The solution is kept in a brown bottle with a glass stopper. For accurate quantitative work, and particularly for experimental work concerned with standardization, the use of gold chloride solutions of tested gold content is indicated. The simple permanganate titration [4] may be used for this purpose, but from the practical standpoint the testing of the prepared sol turbidimetrically is simpler and equally satisfactory. For preparing the 1.5 per cent sodium citrate solution, the weighing out of 3.0 gm. of Baker's T. P. on a good torsion balance and dissolving in pure distilled water up to 200 ml. yield sufficiently accurate results. The solution must be freshly prepared, since it is readily contaminated with molds.

In boiling the citrate gold, the volume and the shape of the container are of significance. A 2 liter Florence flask, not a beaker, of Pyrex glass is reserved for this particular purpose; batches of 1,500 ml. are invariably prepared. The flask is heated on a heating shield over a very large burner. Since it is important to keep the evaporation as constant as possible, an occasional check on this factor is indicated, as well as on the time until boiling occurs; the use of a reflux cooler is unnecessary. Before the gold sol is boiled, the flask is cleaned by boiling pure distilled water in it for 10 minutes. After the flask has been rinsed, 1½ liters of pure distilled water are brought to a rolling boil.

The gold chloride is then added with a 10 ml. Ostwald pipette, the flask is vigorously twirled, and 10 ml. of 1.5 per cent citrate are added in the same way. The flask is again twirled and then returned to the flame. First, a blue color appears, which, after some time, sharply changes to red. Then the boiling is continued with lowered flame for 3 minutes, at which time the preparation is complete.

The gold sol cannot be stored in ordinary glass, as recommended by Borowskaja, because the walls of cheap glassware may become lined with a precipitate of blue gold within 24 hours. Two liter Pyrex bottles with glass stoppers are satisfactory. The bottle is first rinsed with a small portion of the hot gold sol and after the rest is poured into it, it is cooled for ½ hour in a vat with cold tap water. The Florence flask is rinsed with pure distilled water before the next batch is boiled. During the cooling, the storage bottle is closed with a cotton plug covered with cheesecloth, subsequently replaced by the glass stopper, which may be covered with paraffin to prevent sticking. The storage bottles are cleaned by steaming. Aqua regia is used only to remove a visible precipitate of gold, followed by a most thorough rinsing and, finally, steaming. After the turbidity has been checked to determine that it is in the normal range, the batches of citrate gold are pooled. At present, the gold sol is kept in a refrigerator compartment at a temperature of from 9 to 14° C. The aging is more rapid at higher temperatures, while on the other hand, the gold sol coagulates when it freezes. In any laboratory in which a sufficient number of cerebrospinal fluid examinations are performed, interference by aging is best eliminated by preparing only a sufficient amount of citrate gold for 1 week's use. The extent of aging may be determined by the turbidimetric test; however, the citrate gold is so inexpensive and so easy to to prepare without failures that it is not worth while to run the risk of using older citrate golds.

THE TURBIDIMETRIC CONTROL OF THE REPRODUCIBILITY AND AGING OF CITRATE GOLD 1:10,000

The reproducibility of citrate gold

1:10,000 depends primarily on the relative purity of the distilled water used; the purity is easily and reliably checked by the turbidimetric testing of the gold sols prepared from it. In order to demonstrate the effect of impurities, three experimental batches of gold sol were prepared; the first with "pure distilled water" prepared according to the preceding prescriptions; the second with "ordinary distilled water" the use of which was recommended by Borowskaja as a valuable simplification embodied in her technic; the third with pure distilled water to which 0.2 mg. per cent copper was added in the form of copper sulfate. The three gold sols exhibited to the naked eye such a spectacular difference in color and transparency that there could be no doubt about the fact that there was great difference in the particle size; the second and third batches were easily recognizable failures. The fact was observed, with the help of adequate test fluids, that the sensitivity of freshly prepared citrate gold 1:10,000 runs exactly parallel to its turbidity; after prolonged aging this no longer holds true.

The turbidity is determined with the photoelectric colorimeter; the Klett-Summerson is used in this laboratory with red filter No. 66 and the ordinary macro tubes, the interchangeability of which must be checked; the zero point is set with distilled water. The turbidity of the above three batches was equivalent to 138, 64, and 35, respectively; the last named batch was pale red in color and of highest transparency. These three batches when employed in the gold reaction, of course, yielded entirely different results. The turbidity of satisfactory citrate gold 1:10,000 lies around 130; variations from 120 to 140, or even more, are of no demonstrable significance. The turbidity of gold sols begins to decrease even during the cooling of the freshly prepared gold sol and continuously afterward; after 3 days, there is a progressive slowing in the rate of change. In order to maintain fairly uniform conditions, the turbidity of a batch is determined after about 24 hours in the refrigerator at from 9 to 14° C.

Failure to obtain uniform citrate gold sols is often due to contamination of the ordinary distilled water. When the distilled water absorbs even small traces of copper from the still, pipes, or fixtures, marked variation in the turbidity of citrate gold sols prepared with such water will result. The effect of contamination with copper is shown in the third batch. There are additional possibilities of contamination in ordinary distilled water; in large stills with a float by which a constant level in the steam generator is maintained, there is no opportunity for volatile contaminating substances to be removed that otherwise are eliminated by discarding the first run. The failures invariably occurring when ordinary distilled water was used were exclusively associated with a too low turbidity. There is no reason for endeavoring to use ordinary distilled water, especially since a single distillation in a good still suffices for the preparation of satisfactorily pure distilled water.

As previously stated, the gold content of the stock solution may vary because of the inconstancy of the commercial gold chloride, which does not lend itself to the accurate preparation of a standard solution. The reproducibility of citrate gold 1:10,000 depends mainly on the purity of the distilled water and the gold content of the stock solution. The citrate solution can be readily prepared with accuracy, and failures in the preparation of gold sol in this laboratory have never been attributable to the citrate solution. Satisfactory purity of the distilled water is demonstrated if a fairly con-

stant turbidity is obtained in the examination of different batches prepared with the same gold solution. If the standard turbidity of about 130 is not obtained when "tested pure" distilled water and a new stock solution of gold chloride are used, the conclusion must be that the gold content is inaccurate. Actually, the previously mentioned permanganate titration of the gold is superfluous, because the gold content may easily be regulated so that the standard turbidity of approximately 130 is secured.

Finally, the turbidimetric method provides the best means for following, in a quantitative manner, the aging of citrate gold 1:10,000. Heretofore, an exact study of aging was impossible, mainly because of the great irregularity in the rate of change of the sol after a certain period of time. Although many factors that play a rôle in aging may be unknown at present, the satisfactory character of the sol may without difficulty be determined, so that the final results of the gold reaction remain reproducible with the highest degree of accuracy required. In the quantitative gold reaction, the effect of aging is reliably eliminated by restricting the use of a batch of citrate gold 1:10,000 to only 1 week. Even during this short time, the turbidity decreases, as from 130 to 100, with a corresponding decrease in the sensitivity. A decrease within a limited range does not affect the final result, since in the quantitative gold reaction the changes are quantitatively compensated by the use of the gold color standard, while in qualitative technics such slight differences could hardly be detected.

After a prolonged period of aging, either a sediment or precipitate of gold forms on the glass walls, indicating deterioration of the batch, or, less frequently, the gold sol, while remaining clear for a long time, exhibits a progressively decreasing turbidity.

Citrate gold 1:10,000 may occasionally be used considerably longer than 1 week, namely, as long as the test fluid yields the same curve as with freshly prepared gold sols, and the turbidity is not markedly lower than 90. It is unnecessary and unwise, however, to risk difficulty by using a citrate gold sol 1:10,000 more than 1 week old, and the maintenance of a fixed schedule of use, at least in the quantitative technic, is advisable.

SUMMARY AND CONCLUSIONS

Gold sols for use in the colloidal gold reaction prepared by reduction with sodium citrate have several advantages over the neutral formol gold, which, although effective, is difficult to prepare and is subject to unsatisfactory modifications. Gold sols of widely varying particle size may be obtained by reduction with sodium citrate. Further advantages are that the range of pH for effective reduction is broader, and the distilled water need not be as pure as was required by the formol method.

Gold sols obtained with a concentration of sodium citrate of 1:10,000 have a similar sensitivity, at pH 7.4 of the milieu, to that of formol gold. This is about the optimal sensitivity; gold sols prepared with higher concentrations of citrate, which are of an orange-red color, are unsatisfactory for purposes of the gold reaction.

Citrate gold 1:10,000 is definitely acid. The simplest way to neutralize this acidity in order to maintain the obligatory pH of the milieu, around 7.4, consists in the use of strong buffers as diluent, instead of saline.

The simple determination of the turbidity of citrate gold 1:10,000 with the photoelectric colorimeter provides an accurate and objective control of its reproducibility. The progress of aging may be similarly checked. By this method of control, identical gold

sols can be employed in different laboratories.

An amazingly simple qualitative test can be performed using citrate gold 1:10,000 in combination with buffers. The widespread vitiation of the results of the gold reaction, demonstrated by the appearance of false paretic curves in purulent meningitis, is easily eliminated in this way. The real value of this combination of standardized gold sol and buffers, however, will be appreciated only if the results are recorded quantitatively with the easily prepared gold color standard. The technic of this thoroughly controlled quantitative gold reaction actually offers less difficulty than the original qualitative technic or its many modifications suggested as technical modifications.

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Army Seeks Sanitary Corps Officers

According to an announcement of the U. S. Army, Office of the Surgeon General, Sanitary Corps officers have been placed in the scarce category. The Preventive Medicine Service of the Surgeon General's office is seeking qualified men to become commissioned officers and has announced the minimum requirements for enlisted personnel for appointment as second lieutenants. Applicants must have a bachelor's degree with an appropriate science major and a minimum of 2 years' experience in the particular field in which the applicant is qualified. In exceptional instances, bacteriologists, biochemists, serologists and parasitologists may be considered for a commission upon the completion of one year of Army laboratory experience.

Backflow Preventer Installations

IRVING REICHMAN

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THE definition of requirements for correct air gap and backflow preventer installation, as set forth in the new ASA standard,[1] has served to clarify some of the problems involved in this phase of water supply protection. Inspection of a large number of backflow preventer installations has disclosed certain difficulties, some of which result from departures from the provisions of the present standard. An analysis of such faulty installations indicates that in the majority of cases there was a lack of acquaintance with the principle and operation of these devices.

The purpose of the backflow preventer (also known as a vacuum breaker, siphon breaker, anti-siphon valve, etc.) is to prevent back-siphonage of polluted or spent water into the water supply system when negative pressure (vacuum) develops in the supply line. It does this by breaking the vacuum, that is, by admitting air when the water flow ceases or reverses, as occurs under negative pressure conditions. The disc, piston, float, flap, vane or other closing mechanism in the mechanical type backflow preventer should close the air port or inlet under positive water pressure and open it when this pressure is removed. In other words, when the water pressure drops to a point too low to keep the disc, etc., in the "closed" position, then the disc should drop of its own weight to the "open" position. However, if the outlet end of the backflow preventer is under appreciable head, then instead of opening the air port when the flow is stopped or reversed, the disc, because of the back pressure, may remain in the "closed" position or partly open, with the result that polluted water may flow or be drawn back into the supply system. This will not occur with all backflow preventers, the possibility generally depending on the particular design. In order that there may be no head on the outlet end it is essential that the backflow preventer be set above the level of the highest fixture outlet under supply line pressure. It must, of course, also be set above the highest fixture inlet and the fixture flood-level rim; requirements generally specified in the manufacturer's installation instructions. Back pressure may be caused not only by static head but also by pump discharge head. Supply lines equipped with backflow preventers should not be connected to pump discharge lines.

Paragraph 66 of the ASA standard prescribes the following limitations regarding the installation of backflow preventers:

"The backflow preventer shall be installed between the control valve and the fixture so it will not be subjected to water pressure, except the back pressure incidental to water flowing to the fixture.

"*Backflow preventers, as prescribed herein, shall never be installed on inlet side of control valve, as they should not be subjected to constant water supply pipe line pressure.*

"*Furthermore, all backflow preventers shall be correctly installed according to the instructions supplied by the manufacturers.*"

The first two of these requirements practically preclude the use of positive side (inlet or pressure side) backflow preventers. These particular preventers are designed for use under direct or constant supply line pressure, i.e., either without a control valve or on the positive or inlet side of a control valve, as the latter is defined in the standard. Although no specification or provision for such installations is contained in the present standard a large number of positive side backflow preventers have been and are being installed. Their use in New York City is at present authorized by the Board of Standards and Appeals, and their installation is accepted under plumbing code and water department regulations.

Because positive side backflow preventers have both the inlet and outlet threaded, and some will allow water to flow in either direction, there have been instances where the supply line was found connected to the outlet and the discharge line to the inlet. This mistake of setting the backflow preventer on a side or treating it like an ordinary elbow has been most common in the installation of the smaller sizes. It is essential that the preventer be installed upright, otherwise the closing mechanism will not be actuated by gravity.

A backflow preventer should be of ample size, at least that of the supply line to it, in order both that the air port area may be sufficient to afford full vacuum relief and to reduce pressure loss. Some backflow preventers cause an appreciable pressure loss and this reduction in water pressure may prove troublesome. Where the inlet pressure of an unprotected supply to a fixture, machine, apparatus, etc., is just sufficient for proper operation, the installation of a backflow preventer may result in an outlet or residual pressure lower than that required for satisfactory operation of the fixture, etc. This sometimes occurs with commercial and industrial installations in low pressure distribution areas, and is also quite frequently true of flush-valve type backflow preventer installations where the inlet pressure at the fixture is poor or barely sufficient to start with, as is often the case on the upper floors of a building wholly supplied through an up-feed system. (A down-feed system, although subject to static pressure conditions similar to those of an up-feed system, is ordinarily not subject to backsiphonage.) Given sufficient volume, the effectiveness of siphonic action flushing of a water closet, for example, depends chiefly upon the pressure at the fixture inlet. Where this pressure is too low it often becomes necessary to flush five or six or more times before cleansing results. In this regard, inspectional tests have shown many flush valve-backflow preventer installations which were acceptable from the sanitary standpoint in that the possibility of contamination through backflow was eliminated, but which were unsatisfactory from the conservation standpoint in that water waste was either introduced or became worse. On sanitary inspections calling for backflow elimination the author makes pressure tests to guide him in writing the correction specifications. Where the static or the estimated residual pressure is found to be insufficient for proper operation of flush valves a frequent recommendation is the replacement of the flush valves by anti-siphon flush tanks. Other tests and recommendations for backflow prevention are also made and these vary according to the particular conditions or circumstances.

Outdoor backflow preventer installations should, wherever possible, be avoided. Aside from the danger of freezing, the greater objection is the possibility of dust getting into and clogging the air ports. This would make the backflow preventer ineffective;

therefore, unless unavoidable, these devices should not be installed outside or in inside locations where they would be subjected to heavy dusts, particularly those of an industrial nature. However, where this is unavoidable, as with some outdoor water supplied structures, playgrounds, etc., then some form of dust hood such as a simple, inverted (open bottom) cylindrical can, about 1½ feet long, should be fitted over the backflow preventer, and the entire assembly examined periodically.

The author has seen backflow preventers correctly installed on jobs under construction, only to come back a week or two later to find that the pipe coverers had covered and completely sealed in the preventers as they often do check valves and other fittings. Hence the advisability of a final inspection. In at least one instance a Venturi-type backflow preventer was disconnected and removed because "it was entirely too noisy." Spurting (spitting) and leaky preventers are a nuisance. An obstructed or improperly seated disc will cause a continuous leak through the air inlet. Tamper—in a few cases air inlets were found plugged—has resulted from attempts by the inexperienced to stop such leaks.

A backflow preventer installed on the positive or inlet side of a control valve or fixture in continuous service is constantly under supply line pressure and quite a few positive side preventers have been found in which the disc or operating part was immovably frozen in the "closed" position. Backflow preventers in this condition are obviously useless for preventing backflow. Although a proper air gap is the best protection against backflow, the use of a check valve as an additional safeguard with positive side backflow preventers merits some consideration.

Regarding check valves it is frequently asked, "Isn't the ordinary check valve sufficient protection against backflow?" A good check valve in good working order and properly installed would, in general, prevent backflow. But check valves, unless they are examined regularly and often, are not to be relied on, especially after they have been in service some time. Checks which do not seat properly because of obstruction or defect are common. In a recent investigation of a water contamination hazard in a hospital comprising several units, the source of the trouble was traced to a defective swing check in one of the buildings. A check valve alone is not sufficient protection against backflow, but when installed on the outlet side of a backflow preventer the combination may be considered a more satisfactory, though not necessarily an absolute or permanent, protection.

Backflow preventers have been mistakenly used as pressure relief valves on water-cooled refrigerating unit installations.[2] Contrary to code, a number of spring-actuated vacuum breakers have been connected in water supply lines, but wherever found these are ordered removed. In New York City only those backflow preventers which are approved by the Board of Standards and Appeals are permitted, and thus far none but the gravity-actuated type of mechanical backflow preventer has been approved.

The steady improvement in backflow preventer design has helped to eliminate faults inherent in some of the earlier models. Other difficulties connected with the use of backflow preventers will also disappear as codes are clarified and coördinated and information on these devices is disseminated.

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American Journal of Public Health
and THE NATION'S HEALTH

Official Monthly Publication of the American Public Health Association

Volume 34 October, 1944 Number 10

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SELSKAR MICHAEL GUNN

THE death of Selskar Gunn on August 2 has deprived the cause of public health of one of its wisest and most imaginative leaders.

He was born in London, May 25, 1883, of partly Irish ancestry which helped to color his vivid temperament. After coming to this country, he became one of "Sedgwick's boys" taking his bachelor's degree at M.I.T. in 1905 and, later, his C.P.H. at the Harvard-Technology School for Health Officers in 1917. He began his career as a bacteriologist (as did so many public health pioneers of his generation); served as Health Officer of Orange, N. J., in 1908–1910; and taught under Sedgwick at M.I.T. from 1910 to 1919, rising to the rank of Associate Professor. He held a post on the staff of the Massachusetts State Department of Public Health from 1914 to 1916.

Selskar Gunn rendered invaluable service to the American Public Health Association during the formative years of its transformation from a small group of health officers to a strong continental professional society. He was Secretary from 1912 to 1918; Managing Editor of this JOURNAL from 1912 to 1914; and Editor from 1914 to 1918.

The first World War drew Gunn into the wider international fields of public health which were to command his major interest for more than twenty years. He served with the American Tuberculosis Commission in France (and as a Captain in the Red Cross) from 1917 to 1920; as Advisor to the Ministry of Health of Czechoslovakia from 1920 to 1922; and in the Paris office of the Rockefeller Foundation from 1922 to 1932. He was placed in charge of all the health work of this organization in the European area; and was made a Vice-President of the Foundation in 1927. His intimate knowledge of problems and personalities—with the prestige of the Foundation behind it—proved of incalculable value. The writer recalls one typical instance. The position of Stampar, the splendid health leader of Yugoslavia, was threatened by a political cabal. Gunn took the Orient Express and called on the King to say how pleased the Foundation was with the magnificent progress Yugoslavia was making under Stampar's guidance. That was all; but it was enough. Stampar's good work went on.

In 1937 Gunn was sent by the Foundation to China where he remained for

the better part of five years. The plan which he developed for a broad program of social welfare—in which the artificial boundaries between health and education and agriculture and economics were broken down—was perhaps the most significant achievement of his life. When the menace of Japanese imperialism is overthrown, this program will certainly be realized as a basis for the great emergent China of the future.

Since 1941 Gunn has been at home again, primarily engaged in the direction of a comprehensive study for the National Health Council of the functions of voluntary health agencies in the United States—a study which will shortly be completed by his associate, Philip S. Platt. In 1943, he served as the Secretary of the Committee appointed by Governor Lehman to organize the work of OFRRO, evolving plans which greatly facilitated the operations of its successor, UNRRA.

Selskar Gunn, among other honors, received decorations from the governments of Czechoslovakia, Denmark, France, Norway, Poland, and Yugoslavia. The fruits of his efforts in many parts of the world and the love of his friends meant more to him than any merely tangible rewards. His courage and loyalty, his wisdom and statesmanship, his driving conscience, his warm and eager and intensely human personality made him very dear to us. With him, we think always of the wife (Carroll McComas) whom he married in 1933 and who did so much during the past ten years to make his life happy and fruitful.

WHAT PRICE, THE SCHOOL HEALTH EXAMINATION?

THE routine machinery of the school health examination is now once more in active operation, throughout the country. It is one of the largest, and one of the most costly, enterprises in the field of community health. We may properly ask ourselves whether the machine in our home communities is geared to a reasonable maximum of efficiency, whether it is turning out the results which we have a right to demand. Justly or unjustly, the high incidence of various physical defects revealed by Selective Service examinations, will inevitably raise questions as to the success of past performances. Particularly at the present moment, the shortage of physicians for civilian service makes it imperative to use the time of precious professional personnel in the most efficient manner.

The underlying philosophy of the school health examination is sound. It envisages three procedures which are all eminently desirable:

A periodic medical examination of each child, sufficiently thorough to detect all important physical defects and deficiencies.

The actual use of this examination as a basis for the education of the child and its parents in regard to the application of the laws of health to that particular child; and for the adaptation of the school program, including physical environment, load of home work and physical exercise, to its individual needs.

The correction of those remediable defects which are discovered.

In some cities and even in some small rural communities this ideal is attained in reasonable degree. The family physician, the school physician, and the school nurse in such areas understand their job and coöperate effectively in its performance.

In other communities, the picture is a very different one. In a New York town the task of school inspection was, a few years ago, allotted in rotation to

three local doctors; one examined at a rate of 15 pupils per hour, another at the rate of 60 per hour. In another town the rate was 80 or 90 per hour. Perhaps a world's record was recorded in a recent survey of a Connecticut city—300 examinations made on each morning visit to a school. Where such a system prevails there can obviously be no real detection of defects, no education of the pupil, no hope of constructive service. As to the correction of defects discovered, it may be doubted whether more than a very few school systems have systems of medical bookkeeping of meaning and validity. Some have no records at all; some show 100 per cent correction year after year, with no reduction whatever in the number of defects found in the same children in successive years. The cost of school medical service in 18 New York communities varied from $.17 to $5.17 per child, and the most efficient services were by no means always in the highest cost ranges.[1]

The figures cited above are for extreme cases. Many schools have a health examination program which is sound and fruitful; but it is time that the laggards were brought up with the procession.

One important factor in promoting hasty and futile procedures is the existence of well-meaning but misguided state laws which require a routine physical examination to be made each year. No community is rich enough to provide a real examination on an annual basis; and if it were, such a procedure would be a needless waste of medical time. What we need is an examination (including heart and lungs) made in the presence of a parent and combined with specific instruction in personal hygiene which would require on the average at least 20 minutes. Examinations should be made before school entrance and, as a minimum, twice more during the period of school life and finally at the termination of school life; and always, of course, at any time on referral by nurse or teacher or after absence due to illness. A study made in Astoria, N. Y., showed that two to four times as many children with defects needing attention (other than those of dental and visual nature) were revealed by referral examinations as by routine examinations.

These physical examinations (either on referral or routine) need *not,* however, be all made by the school physician. Indeed every effort should be made to enlist the services of the family physician where family economic resources will permit. The chance of effective follow-up will be greatly enhanced in such families by this procedure. Full reports on standard forms should, however, be required for the school medical files.

Exactly the same principles should govern the treatment of defects. The family physician should provide such treatment (again reporting to the school service) if the family can pay the costs. If not, local clinic facilities should be utilized; and, only in so far as these are not available, the school medical service itself may be forced to step into the breach.

It is obvious, of course, that the medical examination is but one part of the total school health program, which must also include daily inspections and continuing classroom observation by the teacher, school nursing service, and home follow-up, coöperation of parents, availability of treatment facilities, and—above all—intimate integration into the total program of school health education and physical education.

Finally, if the school medical service is to operate successfully competent expert supervision is essential. Most school physicians are—and should be—part-time employees. Today, what they know about their task is—too often—that

the law calls for "an examination," and that they have the job of making "examinations" at so much a head. The payment on a capitation basis itself directly tends toward a high pupil-per-hour maximum. Part-time school physicians should be paid for their time, not on a capitation basis; and they should be supervised by a competent full-time local or county or state full-time school physician. The qualifications for such full-time school physicians have been outlined by the Committee on Professional Education [2] of the A.P.H.A.

The ideal set forth is not a Utopian dream. It is attained in certain favored areas; and it represents merely the adequate performance of our duty to the taxpayer who pays the cost and to the child who needs the services. The present service is in some communities the weakest link in the entire field of public health. Its improvement by the formulation of a definite program of reform is a clear challenge to our recently organized Section on School Health.

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FROM HEALTH HONOR ROLL TO NATIONAL REPORTING AREA

ANNOUNCEMENT, in the May issue of the JOURNAL,[1] of awards to 53 communities in the National Health Honor Roll marks the 15th year of a program designed to stimulate improvement in local public health work. This competition has been fostered throughout by the U. S. Chamber of Commerce and the American Public Health Association and financed by the Metropolitan and other life insurance companies. In 1934 it was expanded to rural areas with the additional support of the W. K. Kellogg Foundation. The Canadian Public Health Association extended the scope to Canada with both English and French forms in 1937. Since the first announcement, 682 communities have submitted approximately 2,100 schedules and 201 different communities have received 615 awards of one kind or another.

The program of the A.P.H.A. in this field has passed through three successive phases. Originally, it was an outgrowth of the earlier experiences of the Committee on Administrative Practice which from its inception in 1920 had been interested in the construction of a simple method of expressing the mass of descriptive and factual material gathered in community health surveys. This interest culminated in the well known *Appraisal Form*, which was published in its first edition in 1925. The *Evaluation Schedule*, produced in its first form in 1929, was a modification of the *Appraisal Form*, reduced in size and with somewhat different emphases in aims and structure.

It was Chapin's epoch-making study of state health departments in 1914 that was mainly instrumental in directing attention to the practical advantages of expressing the extensive details of health surveys in terms of simplified numerical scores or grades which would be combined into a single total score. This proposal of expressing public health activity and achievements in terms of numerical scores precipitated heated debate in the early meetings of the Committee on Administrative Practice. Well do we recall how Chapin, Frost, Rankin, Freeman, and others argued back and forth for long hours over the desirability of

this innovation. On the one side was the fear of scientific unsoundness in attempting to place weighted values on the separate measures and practices followed in a public health program. Opposed to this was the feeling that the promotion of public health required some means of ready visualization of degrees of achievement in order to create understanding and interest on the part of both public and professional groups.

The surveys of the hundred largest cities of the country by the U. S. Public Health Service and of the 86 next largest cities by the American Child Health Association prior to 1925 brought to the front the practical necessity of adopting a numerical scoring method to portray in understandable fashion the extensive data there accumulated. It was such mass surveys of many communities rather than the isolated studies of single areas, many of which were carried on during the period from 1910 to 1930, that gave the main impetus to the introduction of the scoring principle in evaluation and appraisal of health work.

The periodically revised *Appraisal Form,* which grew from 40 pages in 1925 to 180 pages in 1938, provided two main features. It was a device for recording data in a uniform manner and it included numerical values and weights of items established by the group judgment of a committee made up for the most part of practising health officers. It was so arranged that the person filling out the form could, at the same time, compute the score attained. The primary purpose of the original form was to enable the health officer to evaluate the strength and the weakness of the various sectors in his battle area. In this respect, the development of an objective appraisal technic was, not only a basic contribution to the cause of public health, but a unique example of scientific self-evaluation of a public service.

In 1929, with the opening of the Health Conservation Contest—later the National Health Honor Roll—the work of the Association entered its second phase—that of inter-community competition. The *Evaluation Schedule* introduced for this purpose did not provide for self-scoring. The scoring was done by a central committee. Furthermore the new form contained several new principles: A poor score in certain important items branded an entire area of action as poor. Good scores in minor items were not permitted to compensate or outbalance poor scores in more important ones. Furthermore, where the *Appraisal Form* placed main emphasis on health department effort such as "number of visits" and "number of inspections," the *Evaluation Schedule* focused on the resulting health protection of the community as a whole, recognizing contributions in effort from all sources—private practitioners, voluntary agencies, and others—as well as from the health department.

Although the *Evaluation Schedule* is still far from a polished instrument, there is evidence of a basic advance in philosophy. It attempts to measure first, problems or needs; second, available resources, and third, as objectively as possible, the degree of success in applying appropriate resources to those various needs. Since the first step obviously is to identify the problems, there is a section on problem definition. Emphasis is placed on viewing the community as a whole. The quality, availability, and cost of medical services and facilities are important factors about which exact knowledge must be at hand if specific action is to be taken. The accent is on measurement of results rather than mere activity, i.e., the percentage of pasteurization plants that meet certain standards, rather than the number of inspections of such plants.

The new *Grading Chart* recently prepared for each participant is a significant

development. A panorama of the public health program is presented on a single sheet. Three columns, "good," "fair," and "poor," in which check marks are placed, have superimposed a system of colors, blue, green, and red. Blue colors the "good" column and some "fair" items, green the "fair" column but many "poor" items, and red the remaining "poor" squares. Column positions measure the items when considered alone. The color indicates the relative importance of the items in grading the section. Grading is accomplished by color, not by points. This system does away with numerical values of "false and delusive accuracy" and prevents compensation of glaring defects by other good programs. Further refinement is desirable but the method promises many interesting applications in evaluation technic.

A notable feature of the evaluation program has been the issuance with the aid of the Commonwealth Fund in 1943 of an intriguing booklet entitled "Health Practice Indices." This contains 60 charts depicting how 134 communities stand, relatively, in public health results, achievements, and activities. This "mirror of public health practices" as it has been aptly called, gives a community an opportunity to compare its own achievements with a sampling of practices over the country. This pictorial background of practice will figure prominently in the new program for the development of a permanent nation-wide reporting area.

The demonstrable contributions of the evaluation process to public health have already been worth many times the time and money invested. The *Evaluation Schedule* and its companion pieces, the *Grading Chart* and *The Indices,* are important today as never before. These tools can be, and frequently have been, used effectively:

1. By *local* health departments as an appraisal of the total community; as a basis for annual reports; as an outline for coöperative programs with related groups; as an index of budgetary needs for new services or equipment.

2. By *local* community groups such as Chambers of Commerce, labor organizations, industries, and others interested in developing more adequate services and facilities. It is particularly well adapted for analysis of war-expanded localities where community facilities such as housing, hospitals, etc., have belatedly been found to be as important as the size of the pay check and good working conditions inside the factory.

3. By *local* groups interested in developing sound post-war plans for new facilities of a community nature, either with local resources or with federal coöperation.

4. By *state* health departments in evaluating problems and programs in city, county, and district units on a comparable basis; in determining budget allocations, relative efficiency of personnel, or the need for supplementary services by the state health department; as a pattern for annual reports, etc.

5. By *national* agencies such as the Chamber of Commerce, labor unions, manufacturers' associations, hospitals, medical associations, U.S.P.H.S., A.P.H.A., etc., for representative cross-sections of the nation's problems and practices.

6. By the *A.P.H.A.* for the preparation of "indices" of current practice for the guidance of its officers, committees, and members, and as a basis for consultative services, program planning, etc., at local, state, and national levels.

7. By *universities* and schools of public health in teaching public health administration; in making useful studies of current practice as a service to local and state units; in developing the analytical sense of students in the true measurement of progress in problem solving and an understanding of truly balanced programs in the light of the needs of the people served.

This broad program for the development of progressively higher standards of public health service is now entering on its third phase. As indicated by its action in December, 1943, the Committee on Administrative Practice has decided to terminate the National Health Honor Roll and the granting of awards to high-

scoring communities. The annual submission of evaluation schedules will continue, but, in place of the awards feature, efforts will be centered on the development of a national reporting area for health practices.

The change from *contest* to *honor roll* a few years ago was in itself a real step forward. The competitive factor began to lose its usefulness as soon as the leaders in each class were definitely established. The honor roll substituted a standard of achievement which any community could attain with a good enough performance. This suggests still another evolution. A nation-wide reporting area (similar to the birth registration area) might be developed by having communities report regularly on a standard form based on the problem-solving philosophy of the present *Evaluation Schedule.* The value of the *Indices* alone would repay the communities for the effort entailed. Such a scheme might eventually prove of value to the U. S. Public Health Service as a means of obtaining a real picture of problems, resources, and accomplishments throughout the country. It certainly would represent a better measure of overall community health protection than reports of "number of services rendered" now customarily requested.

The experience with the Honor Roll in rural areas suggests a usefulness which has only been realized in a few states. In 1943 there were 48 returns from Michigan, 18 from Texas, 17 from Louisiana, 11 from Kansas, and 11 from Oklahoma. Where comparative data of this sort are available, the schedule can provide state directors of local health services with comparable local data based on problems and accomplishment rather than volume of work; and thus enable them to appraise the strong and the weak points in their local health services.

The development on a stabilized and permanent basis of a national reporting area for health practices is a logical and inevitable outcome of this well tried experience in health evaluation. In spite of occasional errors of judgment in the selection of outstanding communities, the fruits of this long pioneering effort have been eminently satisfactory. The practice of annual stocktaking is sound and necessary in reviewing the past and in planning for the future. The visualization of achievements and the opportunity to compare individual results with the general range of practice is a natural and strong stimulus to self-advancement. Such an undertaking merits the hearty support of federal, state, and local agencies in the attainment of its goal.

Not only the American Public Health Association but the cause of public health throughout the world owes a very real debt to the Metropolitan Life Insurance Company, to the W. K. Kellogg Foundation, to the Commonwealth Fund, and to the other agencies which have so generously supported the work of the Committee on Administrative Practice for a quarter-of-a-century. The significant program of Sanitary Indices prepared by the Health Section of the League of Nations was a modification of our American appraisal for international use. It is highly important that the latest and most important phase of our Association's work—the development of a National Reporting Area for Health Practice—shall be brought into full effect. Some way must be found to continue this work with whatever reorganization seems appropriate and with new sponsors if need be. The achievements of the A.P.H.A. in the self-evaluation and improvement of the practices of the public health profession are too vital not to be carried forward.

REFERENCE

1. *A.J.P.H.*, 34, 5:557 (May), 1944.

Credit Lines

"THE PECKHAM EXPERIMENT, A STUDY IN THE LIVING STRUCTURE OF SOCIETY"

At the request of the Managing Editor, George Baehr, M.D., Director of Clinical Research, Mt. Sinai Hospital, New York City, has prepared a review of a most interesting report under the above title by Innes H. Pearse, M.C., and Lucy H. Crocker, B.Sc., recounting an adventure in health center work in London. Very few copies of the report have reached the United States, and Dr. Baehr has been asked to summarize the outstanding features, since he has retained an interest in the project for several years and has familiarized himself with its outworking. His review follows:

This is the third published report on the pioneer health center in London, which was established in 1926 under the leadership of Dr. G. Scott Williamson and Dr. Innes Pearse. The first preliminary report was published under the title, "The Case for Action." The second, which appeared a few years ago, shortly after occupancy of a new building in the Peckham area of London, is called, "Biologists in Search of Material." A fourth publication is promised in the near future.

This health center to provide preventive medical service to families was located in the Borough of Peckham, in South London, an area inhabited by people belonging to various economic levels, from the poor groups to the middle class, and representing various types of employment. The pioneer quarters which were established in 1926 were soon outgrown, and 7 years later a new building of steel and glass was erected which provided a club-like atmosphere and at the same time served as a consultation center to which families living in the district rallied for social as well as health reasons. The new structure was in operation for about 4½ years when the war terminated its activities in 1939.

For the small weekly payment of a shilling by the family unit, the children were entitled to participate in all sport and recreational activities without charge; the adults paid small fees of sixpence or less only for certain of the recreational activities in which they joined.

The new building was adequate for 2,000 families. If this total membership had been reached, the family memberships and the small fees for the use of recreational activities by the adult members of the families would have defrayed the entire maintenance cost of the project. Almost 1,500 families had joined by the time the building had to be closed because of the war.

The health overhaul initiated the family's relationship to the Center. Once they had joined, the families were given complete freedom to use all the health and recreational facilities of the Center without much direction from the small nucleus of full-time members of the staff of the Center. The family health overhaul revealed that a surprising number of people required medical as well as social advice and guidance throughout the period of their membership. Members were classified from a health standpoint into three general groups. The first group included those who had actual disease—meaning *dis-ease* in the literal sense of the term—people who knew that they had physical disabilities and subjective

complaints. They were found to constitute, roughly, about 32 per cent of all members. Another 59 per cent were in a state of well-being—in other words, they had no *dis-ease*—but their physical examination disclosed disorders—some of them important disorders—of which they were entirely unconscious. Only 9 or 10 per cent were classified as absolutely healthy people in whom no physical disturbances could be found. As a result of membership in the Health Center over the years, these percentages were materially improved by correction of the disabilities and by improvement of living standards.

The significance of the Peckham Experiment is greater than that of any other form of preventive medicine which has thus far been attempted experimentally, because it was designed to guide families and helped them to guide one another in all medical, social, and environmental relationships which have an important bearing upon disease. New member families came under the influence of the member families who had been using this health service for some time. As a family increased in size, professional advice and guidance were available as preparation for pregnancy as well as during the prenatal and postpartum periods. Pre-marital consultations were available and were freely used. The children, themselves, brought problems of their own into the Health Center, for which they sought guidance. At the Center, they found quiet space in which to do their homework after school, as well as facilities of all kinds in which to indulge their physical activities. Above all, they found people at the Center who were able to guide and advise them in a sympathetic manner. The adolescents, with their special problems, also found the advice and help which they needed. Those who were of the age when courtship and mating are of special interest found this counsel particularly valuable. Even problems of social poverty were influenced by personal associations made between member families. The members developed an interest in one another. They influenced one another in their cultural development. Many developed a new breadth of vision in living. All these factors had an influence upon the diseases to which they were exposed.

A list of the welfare, educational, and health activities of the Center is impressive. It includes an antenatal clinic, postnatal clinic, birth control clinic, infant welfare clinic, care of the toddler, nursery school, immunization center, medical inspection of the school child, vocational guidance, sex instruction of adolescents, boys' and girls' clubs, sports clubs, and recreational clubs of all kinds. A country branch was established to which some of the family members could be sent during the summer, and to which members could be referred for convalescence after hospitalization or even after illnesses in the home. The building also provided keep-fit and gymnasium classes, adult cultural education, music, debates, drama classes and lectures of all kinds, citizens' advice bureau, holiday outings and expeditions, even a public billiard hall, and place for social gatherings.

Among the therapeutic activities were the marriage advice bureau, mothers' clinic, child guidance clinics, school care committee work, poor man's lawyer, hospital almony, which corresponds to our hospitals' social service, hospital follow-up, including all forms of after-care in their home or convalescent place for members discharged from medical care, and, finally, even a rehabilitation clinic. No actual medical therapy was practised, but members were brought into relationship with the proper agencies responsible for the technical part of rehabilitation or other services.

The Peckham Experiment has dem-

onstrated that families of a mixed economic group will gather together if proper facilities are provided, that they will get the idea of health through proper living, and will coöperate and stick to it over the years. Almost equally important is the demonstration that such a project can be self-supporting when adequate membership has been reached and the facilities of the institution are completely utilized. Although the project was a combination of a family club and a health service, the founders prefer to think of it as a biologists' laboratory designed for the prevention of disease through healthful living and for mutual aid in the amelioration of social poverty. Re-establishment of the enterprise is promised after the war.

PROMOTING HOME SAFETY IN NASSAU COUNTY, N. Y.

The Association's Committee on Administrative Practice has a Subcommittee on Accident Prevention which is paying special attention, under the Chairmanship of Donald B. Armstrong, M.D., 2nd Vice President, Metropolitan Life Insurance Company, New York, to the prevention of home and farm accidents. Through the work of this subcommiteee, the following report is presented on Home Safety Activities of the Nassau County Health Department, N. Y.:

An effective home safety program is being conducted in Nassau County, Long Island, under the auspices of the Commissioner of the Health Department, Dr. Earle G. Brown. Nassau County, containing a number of medium urban communities and rural areas, affords an excellent proving ground for home accident prevention activities. A sectionalized view of the county shows that it consists of two cities, 63 incorporated villages, and 3 townships, with a population exceeding 450,000. The county has its full share of public spirited individuals, many of whom are working on home safety through such organizations as the Red Cross, Nursing Council, Home and Farm Bureau, Child Care Committee, Boy and Girl Scouts, Parent Teacher Associations, and public utility companies.

It is apparent throughout the United States that home accidents are on the increase and Nassau County in the past year has proved no exception. With this in mind, as well as because of the war depleted availability of doctors and nurses, Dr. Brown instituted the Nassau County Home Safety Program which had its inception at the first Home Safety Conference last December. The program was carefully planned to stimulate the interest in home safety of the representatives of approximately fifty community organizations who attended the conference. From the reports of home safety work and the lively discussions conducted at intermittent intervals, it is not surprising that activities unfolded in a succession of stimulating events throughout the following months.

A number of organizations, young in the field of community life, such as the American Women's Voluntary Services and the American Women's Hospital Reserve Corps, at once made plans to incorporate home safety in their programs. Other organizations, such as the Nassau County Woman's Bar Association, gave generous space for a home safety exhibit at their first Woman's Annual Forum. Charts were displayed and literature dispensed at this Forum. The County Federation of Women's Clubs gave time on their program at their Annual Joint Meeting of all the Associated Clubs of Nassau County. An address was given by Dr. Brown, who urged continued action on the part of each member to carry on with home accident prevention work both individually and collectively. Sev-

eral organizations, such as the Police and Fire Departments, the Red Cross, and the Parent Teachers Association, have carried safety programs in their regular curricula for many years, and with an incentive born of Dr. Brown's planning, a new dynamic has been felt throughout all these safety activities. Naturally, these more seasoned organizations received great encouragement from the early winter's Home Safety Conference and with fresh wind in their sails increased both the volume and quality of their speaking, teaching, and poster contest programs, all of which will contribute, undoubtedly, to the decrease in accidents in the homes of Nassau County.

The nursing groups, in particular, show promise of developing into a vanguard of home safety work in the county. They are, of course, in an advantageous position to convey safe home practices wherever the nurses visit. The nurses are showing enthusiasm and diplomacy in their daily work, the technics of which they absorbed in their round table discussions on home safety.

A MINNESOTA INSTITUTE IN HEALTH EDUCATION FOR SCHOOL ADMINISTRATORS

Dr. George M. Wheatley, Secretary of the School Health Section, contributes the following review for Credit Lines:

It has been our good fortune to see a 78 page mimeographed publication from the Center for Continuation Study at the University of Minnesota, called "Health Education." It describes the Institute in Health Education for School Administrators, held at the Center for Continuation Study, January 6, 7, 8, 1944, under the direction of Ruth E. Grout, Associate Professor of Preventive Medicine and Public Health and Education at the University of Minnesota. It will be of interest particularly to health educators and others who are planning workshop sessions on health education. The program for each of the three days is given. The Faculty are listed, and it includes such people as Donald A. Dukelow, Director of Public Health Education, Minnesota State Department of Health; Ruth B. Freeman, Associate Professor of Preventive Medicine and Public Health, the University of Minnesota; Orin B. Graff, Superintendent of Education, University of Tennessee; William A. O'Brien, Professor of Preventive Medicine and Public Health, and Director, Postgraduate Medical Education, University of Minnesota; Dean M. Schweickhard, Commissioner of Education, State of Minnesota; and Clair E. Turner of Cambridge, Mass., and the Office of Inter-American Affairs.

The approximately 75 registrants consisted mainly of superintendents of schools throughout the state, and directors of health and physical education. The talks given by the faculty members of the Institute are reproduced in this publication, and many of them are distinct contributions. For example, Dr. Dukelow's talk on "Making the Health Examination Effective," and the "Educational Aspects of the Health Examination," by Helen M. Starr, Associate Professor of Physical Education for Women at the University of Minnesota, ought to be read by everyone in school health work.

A symposium of special interest which is reproduced, is on the theme, "What Teachers Are Doing in Health Education." This series of talks by (a) an elementary teacher, (b) a physical education teacher, (c) a science teacher, (d) a home economics teacher, (e) a nurse, give those of us who are not familiar with the inside of a public school at the present time a stimulating picture of the potentialities in health education in the classroom. One of the best statements we have read on the

relationship of the school administrator to the school community program is Clair Turner's talk to the members of the Institute on the final day. The informality of his remarks lent color and effectiveness to the idea, and it is well worth writing to the University of Minnesota Press to get a copy of this publication simply to read Dr. Turner's statement. We are told that copies of this publication will sell for 75¢, and can be ordered from the University of Minnesota Press, Minneapolis, Minn.

TRAINING OF TEACHERS BY THE WORKSHOP METHOD

"I want to be identified with the School Health Section," wrote Jean V. Latimer, Coördinator of Health Education for the Massachusetts Department of Public Health, recently, "because the school health program is just now at a cross-road and there are many important things for us to do." She went on, "I think that the School Health Section could help to guide health officers in coming to see that whatever services health departments give to teachers should be in accord with progressive methods of education. Just recently I have seen some teacher training material which was sponsored by one of our more prominent state departments of public health in the West, which was developed on a didactic, old-fashioned type of teaching—a plan which we hope does not spread to other states. I am convinced from actual experience that our in-service training of teachers should be on a workshop basis, rather than on the formal lecture plan. Possibly we need to define and discuss with public health people what we mean by functional health teaching, both for teachers and for pupils. Certainly we need closer relationship between public health and the school administrative group."

Through an interesting coincidence, almost in the same mail came the schedule of summer county workshop conferences for teachers in Kentucky arranged by Reba F. Harris, Associate Director of the Bureau of Public Health Education of the State Department of Health. Seven consultants from the State Department of Health were placed on schedule by Dr. P. E. Blackerby, Commissioner, to work with the workshops. Each was equipped to render a special type of consultant service on such things as communicable disease education, sanitation, tuberculosis prevention, malaria education, eye health problems, and vision and hearing testing. A glance at Miss Harris's outline with its generous use of motion pictures, field trips, demonstrations, chest x-raying of school teachers, and other things would indicate that the two weeks' workshop in each county was a lively affair. The whole plan is an example of the "functional health teaching" which Miss Latimer would employ with both pupils and teachers.

INDIANA WORKSHOP IN SCHOOL AND COMMUNITY HEALTH EDUCATION

The Indiana State Board of Health and Indiana University recently sponsored a Workshop for a period of two weeks at Bloomington under the direction of Willard Walter Patty, Professor of Education and Director of the Physical Welfare Training Department, and Frank S. Stafford, Director of the Division of Health and Physical Education of the State Board of Health and State Director of Physical Fitness for the Defense Council. Those interested in organizing similar Workshops will find it profitable to request outlines of the plans made for this Workshop by addressing Dr. Stafford at the State Department of Health, Indianapolis.

WE APOLOGIZE TO THE AMERICAN DENTAL ASSOCIATION

In August Credit Lines, there appeared an article entitled "How to

Find What Health Education Materials You're Looking For." Through a regrettable oversight the American Dental Association was not included in a list of national sources. Probably we figured subconsciously that everyone knew of the excellent dental health educational literature, movies, charts, posters, and exhibits produced and distributed by the A. D. A. Anyway, we are sorry. Next time we, and our guest editor, will keep our conscious minds on the job. For the record, the address is 222 East Superior St., Chicago 11, Ill., and the Director of the Bureau of Public Relations is Lon W. Morrey, D.D.S.

WORTH ACQUIRING

All the issues of the semi-monthly tabloid *Here's To Your Health,* published by the Fort Greene Industrial Health Committee, 295 Flatbush Ave. Ext., Brooklyn 1, N. Y. This committee is a unit of the Fort Greene District Health Committee of Neighborhood Health Development, Inc., and of the latter, Kenneth D. Widdemer is Secretary. *Here's To Your Health* is sub-titled "What You Don't Know *Can* Hurt You," and it is dedicated to telling industrial workers the simple, practical, elementary things they should know about nutrition, tuberculosis, venereal diseases, the health of mothers and babies, how to take care of a cold, how to avoid accidents on the job, and much more. It began publication on March 1, 1944, and each issue is better than the last. The September 1 issue is devoted to alcohol, although the writers would never say so. They would say it's about drinking, and their readers would understand them.

"Keeping Well," Volume 5 of the radio drama series as broadcast by the Baltimore City Health Department and the Medical and Chirurgical Faculty of Maryland. These dramas deal with the common communicable diseases, including tuberculosis and syphilis, with industrial hygiene, occupational diseases, maternity and child hygiene, mental hygiene, food poisoning, the prevention of accidents, and the history of health broadcasting.

The *Bulletin* of the Research Council on Problems of Alcohol for March, 1944. It summarizes the development of this organization, a constituent society of the American Association for the Advancement of Science. It throws light on the newer developments for the control of alcoholism. Address the Council at 16 East 42nd St., New York.

"There Is Hope for the Alcoholic," Broadcast No. 17, available from the Welfare Council of New York City, 44 East 23rd St. It features Alcoholics Anonymous.

"How to Make a Speech and Enjoy It," by Helen Partridge, illustrated by Mary Stevens, and published by the National Publicity Council, 130 East 22nd, New York 10, N. Y. Price $0.75. The pictures alone are worth the price of admission. The text contains many useful pointers not only for the inexperienced, but for those who are at ease on the platform, from long practice, but who always bore their audiences.

"Planned Health Film Production," by Adolf Nichtenhauser, M.D., Section of Medical and Health Films, American Film Center, 45 Rockefeller Center, New York, N. Y., reprinted from the *Journal of Health and Physical Education* for May, 1944. A discussion of the inadequacy of health films and the organization and financing of planned production.

BOOKS AND REPORTS

All reviews are prepared on invitation. Unsolicited reviews cannot be accepted.

The Principles and Practice of Tropical Medicine—*By L. Everard Napier, C.I.E., F.R.C.P. Calcutta: Thacker, Spink and Co.,* 1943, 522 pp.

This is the first and larger part of a textbook on tropical medicine by the Director and Professor of Tropical Medicine of the Calcutta School of Tropical Medicine who is now Visiting Professor of Tropical Medicine at Tulane University. He undertook the work because, at the time of preparation, there was no recent edition of a textbook in this field in the English language, and because of the demand for it by medical officers in India from Great Britain and the United States who required instruction to meet the demands in connection with the war.

The book is based upon the author's experience in India over a period of twenty years. It begins with a consideration of tropical environment and its relation to diseases, and measures to be taken by natives of temperate climates who take up residence in tropical countries. This is followed by a consideration of diseases due to the direct effects of tropical climate including heat stroke, heat exhaustion, heat cramp, the effects of ultra-violet sun rays, tropical anemia, etc. The bulk of the volume is devoted to malaria, leishmaniasis, trypanosomiasis, relapsing fever, rat bite fever, leptospirosis, the rickettsial diseases, Bartonellosis, yellow fever, Rift Valley fever, dengue and sand fly fevers, plague, tularemia, brucellosis, melioidosis, the intestinal fluxes, and leprosy.

With most of these diseases the author has had personal experience, and his presentations are excellent. He has devoted a large proportion of space to these diseases, and justifiably defends this in his preface by expressing the point of view that an author should give the detailed results of his own experience. The sections on malaria, leishmaniasis, plague, and the intestinal fluxes are particularly good from this point of view. A few of the diseases with which the author has not had personal experience, and which do not occur in India, are less completely presented, and perhaps less accurately. In the case of yellow fever, for instance, a map indicates that urban yellow fever is still endemic in parts of Central and South America from which it has been eliminated.

The work is presented primarily from the practitioner's point of view, and includes many important details of clinical diagnosis, but does not pretend to be a laboratory manual. Most of the illustrations, particularly maps, temperature charts, life cycles, and clinical photographs, are excellent. The colored plate illustrating intestinal parasites and arthropods, however, could be improved with considerable advantage. The author states that the completion of the work was prevented by his departure for the United States, but that much of the second part is in an advanced stage of preparation. This will include chapters on yaws, tropical ulcerative conditions, helminthic infections, dietary diseases, anemias, and snake bites. The index to the work has been postponed also, but the table of contents at the head of each chapter contains considerable detail.

The reviewer considers this an important contribution to the teaching and

reference literature on tropical diseases. It should be in the hands of all instructors in this field as well as libraries, military units of the armed forces, and many students of tropical disease. It is to be hoped that an American edition of the complete work with necessary revisions can be published in the near future so that it will be more easily available to American readers.

HENRY E. MELENEY

Industrial Ophthalmology — *By Hedwig S. Kuhn, M.D. St. Louis: Mosby,* 1944. 293 pp., 112 illus. Price, $6.50.

This pioneer textbook has a unique place in that it appeals to two classes—the management group and industrial medicine—groups that in the past have been too widely divergent for the common good. It is to be hoped that these writings will correlate their efforts more closely.

The first three chapters are devoted to a very skillful presentation of the visual problems in industry, such as job analysis and the qualities of vision required for each job, technics for mass visual examinations, how visual defects among employees can be corrected, etc. These details are well illustrated, mainly by photographs, the majority of which are completely pertinent to the subject.

The fourth chapter comes from the expert pen of Dr. A. C. Snell and deals with industrial eye injuries. This is too technical for lay management to comprehend and a bit too elementary for the industrial ophthalmologist, but presents the matter clearly for the non-specialized industrial surgeon. Certain highly technical details of a specialized surgical nature could well have been omitted, but on the whole the chapter is well worth while.

Chapter V on Eye Protection is one of the most important parts of the book, emphasizing prevention of blindness from industrial accident. The chapter is well written, well illustrated, and should be taken to heart by the management group as well as by the insurance group, interested in lowering the costs of compensation for eye accidents.

The final part of the book is given over to some of the newer aspects of industrial ophthalmology, flash-welding damage, shipyard conjunctivitis, etc. By and large, the book is very worth while and will bear close study by anyone even remotely connected with industrial ophthalmology.

HARRY S. GRADLE

Rose's Foundations of Nutrition —*By Mary Swartz Rose. Revised by Grace Macleod, Ph.D., and Clara Mae Taylor, Ph.D. (4th ed. rev.) New York: Macmillan,* 1944. 594 pp. Price, $3.75.

So far as this reviewer is able to judge, this newly revised edition of Mary Swartz Rose's famous text is not greatly different from the previous one. The table of contents is essentially the same. Some slight rearrangement in the order of the treatment of topics is noted. The number of tables found in the appendix is greater, thus making the new edition more serviceable to many readers. One now finds tables dealing with such topics as market lists for moderate cost, low cost, and liberal meals, tips on buying and using food, vitamin equivalents, and the recommended dietary allowances of the National Research Council. The frontispiece of the former edition was a picture of Lavoisier; in the new edition one finds a good reproduction in color of a portrait of Dr. Rose, a fitting addition to the first revision of her book to be made by others after her death.

The format is slightly different, the new page being a bit larger. Certain sections of the former edition that were somewhat difficult to read now appear in larger type. Evidently this

matter of legibility was given careful attention because one finds also that many of the illustrations of the former edition are now printed in a manner much easier to read and appreciate. The larger page made it possible to keep the total compass of the book within 600 pages. One can offer further interesting evidence that the new edition was completely reset in type in the fact that on page 237 appears a passage identical with one in the previous edition except that in this paragraph this reviewer's name is now misspelled.

This 4th edition certainly maintains the high standard of excellence set by the previous editions, and is a volume worthy of a place on the shelf of everyone interested in the science of nutrition. GEORGE R. COWGILL

The History of Miners' Diseases—*By George Rosen, M.D. New York: Schuman's,* 1943, 490 pp., illus. Price, $8.50.

This book presents a comprehensive research into a varied literature extending from Egyptian manuscripts to medical literature of the late 19th century.

The bibliography is voluminous and should be most valuable to students in industrial medicine and sociology. From a medical standpoint, the book covers a tremendous field in the long, and at times controversial, study of the pulmonary diseases of miners, and a criticism may be offered that there is frequent repetition, possibly due to the fact that the author's studies have covered the literature of France, Belgium, Scotland, and England. Much of interest in this book comes from its portrayal of the ages long social struggle of this important industrial group, as well as of other industrial workers.

Dr. Rosen has performed a monumental task and it is to be sincerely hoped that he will later present a second work covering the great developments of the 20th century from not only the social and medical, but also from an engineering standpoint.

LLOYD NOLAND

Medical Care of the Discharged Hospital Patient—*By Frode Jensen, M.D., H. G. Weiskotten, M.D., and Margaret A. Thomas, M.A. New York: Commonwealth Fund,* 1944. 94 pp. Price, $1.00.

This small volume is recommended as required reading for public health workers concerned with preventive medicine. It represents a one year experiment in extending extramural medical care to 902 patients discharged from the medical wards of the University Hospital in Syracuse, N. Y., of whom 165 patients were given home medical care by a full-time extramural resident. The experiment which was financed by the Josiah Macy Jr. Foundation was undertaken as a result of a teaching experiment introduced into the curriculum of the Syracuse University College of Medicine in 1930. Certain faculty members felt that medical education was laying too much stress upon disease rather than upon the patient suffering from disease. The responsibility was, therefore, placed upon each student of making a complete study of at least one patient, including a personal investigation of the home and the living and working conditions of the patient, and of the hereditary, environmental, social and economic factors which might play a significant part in the patient's illness or recovery.

The participants soon realized how unsatisfactory was the medical care available to most ward patients after discharge from the hospital. Approximately 85 per cent of the ward patients suffered from chronic diseases, and 90 per cent of the cost of hospitalization of patients on the general hospital wards was expended for such chronic illnesses. The extramural resident, who was also a member of the indoor medical

staff, knew all the patients before discharge, and as he was to take care of them in the home, the duration of many patients' stay in the hospital could be materially shortened. As was to be expected, many of the patients who received intelligent extramural medical care no longer found it necessary to return to the hospital repeatedly after discharge. When subsequent hospitalization was essential, they returned to the same hospital and remained for a much shorter period than patients hospitalized for the second time in another institution. One of the greatest savings was in the decreased need for re-hospitalization of patients with chronic cardiovascular diseases, who were responsible for approximately one-fifth of the total cost of hospitalization during the period of the experiment. The extramural resident took complete care of the 165 patients who had no physicians, but he also followed up patients discharged to the care of family physicians, the outpatient clinic and those who were transferred to other institutions. His influence in the homes of patients in disease prevention was perhaps the most important contribution of the experiment.

GEORGE BAEHR

Healthful Living for Nurses—*By Harold S. Diehl, M.D., and Ruth E. Boynton, M.D. New York: McGraw-Hill,* 1944. 534 pp. Price, $2.50.

In *Healthful Living for Nurses,* the authors have presented not only a textbook but a reference handbook. Each of the 23 chapters is a brief text in itself presenting a wide range of topics of interest, beginning with "Safeguarding the Health of Nurses" and ending with "Community Health." One may be misled by the title "Healthful Living," for much of the book is given over to the discussion of disease. However, in each case preventive measures are suggested which if followed contribute to healthful living, and Chapter X considers specific disease prevention.

In the first section of the book, the authors frequently refer to the nurse in the hospital and consider problems found in the institution. Keep on reading—for the nurse *not* in the institution will find the field broadens and principles that can well be carried over to the home, industry, or community organization are presented.

Each chapter presents the subject by a general overall review in digest form. No one school of thought is stressed but, with careful consideration, the East, West, North, and South—the scientist, philosopher, novelist, poet, and the authors contribute their thinking on the topic. The material is written in an interesting style.

After reading the book, you may wonder what the authors feel about certain controversial questions—the use of stimulants, the effect of smoking, or alcoholic beverages. The reader is allowed to consider various phases of the problem by the presentation of diverse points of view and by suggestions for other reference reading so that the answer to the question, "what will be my attitude toward?" is the reader's and not the authors'.

In addition, the student, the instructor, the group leader, will be grateful for the "Discussion Suggestions" and the "Reference and Reading Suggestions," found at the end of each chapter. Visual aids such as tables, charts, and diagrams are generously included all through the book as well as in greater detail in the appendices.

In the preface the authors modestly state that the subject matter has been brought up to date and made "applicable to the health problems and responsibilities of nurses." It might well be called the "What's What" in reference material for health orientation courses.

CAROLINE E. FALLS

Small Community Hospitals—*By Henry J. Southmayd and Geddes Smith. New York: Commonwealth Fund,* 1944. 182 pp. Price, $2.00.

In a very readable manner this volume discusses hospital procedures and standards which are of direct interest to administrators, staff, board members and organizations working in coöperation with hospitals. While the material covered applies directly to the small community hospital, certain chapters of the book (particularly "Organization and Administration") are applicable to large institutions as well.

The rural hospital is discussed in terms of the experiences of a group of fourteen hospitals scattered from Maine to Utah which have been built under the Commonwealth Fund program. The book, written in non-technical language, takes up the contributions of the board of directors, the medical staff, and the superintendent and her staff. Each chapter attempts to treat the subject in hand from an objective point of view, dealing impartially with both professional and lay personnel. While it stresses the functional side, a chapter on building design, illustrated with diagrammatic plans, has been included.

In addition to the seven chapters, an Appendix has been included, listing, in addition to much valuable information, the fourteen hospitals built under the Commonwealth Fund program.

Any criticism which may be offered of the book would be only favorable. The volume is small, but contains a wealth of material. There is need for just such a book. J. ROY HEGE

The Problem of Changing Food Habits—*Report of the Committee on Food Habits. Bulletin 108. Washington: National Research Council,* 1943. 177 pp. Free to Professionals and Agencies.

The Committee on Food Habits, largely made up of scientists from the fields of psychology, anthropology, and sociology, assumed the responsibility for this report "upon the methods of controlling the cultural forces which cause food habits to change."

In the preface, M. L. Wilson, Chief, Nutrition and Food Conservation Branch, War Food Administration, Office of Distribution, congratulates Dr. Carl E. Guthe, Chairman, and Dr. Margaret Mead, Executive Secretary, for the work of their committee. He says that "a new science of food habits is developing. This will be a handmaid to, and of equal importance with, the biochemical science of nutrition in efforts for the prevention of disease and facilitating man's progress toward optimum health."

The content covers a large amount of subject matter and is divided into four parts. The introductory chapters on the history of the committee by the Chairman, and the problem of changing food habits by the Executive Secretary are included in Part I. In Part II are reports on "Demonstration and Research conducted under Committee auspices." In Part III "Related Research" is reported, and in Part IV "Summaries of Committee conferences" are recorded.

A bewildering aggregate of information has been made available to the reader. It might perhaps have been arranged in a more logical fashion.

GERTRUDE GATES MUDGE

The War and Mental Health in England—*By James M. Mackintosh, M.D. New York: The Commonwealth Fund,* 1944. 91 pp. Price, $.85.

This little book of essays is presented in very scholarly fashion by one of England's most distinguished authorities in the field of public health. Dr. Mackintosh has long been identified with the mental hygiene movement.

The first part deals with the impact

of war and carries the reader through the processes of adjustment on the part of the English people during the years 1939 and 1940. The fortitude evidenced by the entire population during the lonely years of 1940 and 1941 develops in the reader nothing but admiration for the way the English people have met adversity and prepared for the defense of their liberties.

Part two, "Mobilization for Peace," deals with post-war planning. Two statements present a challenge. "An interesting and hopeful development which has arisen indirectly out of the emergency hospital service is a growing emphasis on the mental health aspect of general hospital treatment." This is undoubtedly one of the greatest defects in the general hospital program in this country. The author in presenting some problems of the future has this to say about education: "Education must be the central feature of a post-war program for mental health. It is only through systematic health education beginning with the expectant mother and carried on with unfailing continuity from infancy to adolescence in the child that one can hope to create a generation of healthy people. . . . Even preventive medicine spends its effort upon the intermediate stages of disease. Child guidance, for example, is frequently concerned with behavior problems of children which could have been prevented by education; and the school medical and dental services spend far too much of their time in repairing faults that should not have occurred." MILTON E. KIRKPATRICK

Inadequate Diets and Nutritional Deficiencies in the United States—*Report of the Committee on Diagnosis and Pathology of Nutritional Deficiencies. Bulletin 109. Washington: National Research Council,* 1943. 56 pp. Price, $.50.

All workers in the field of nutrition and public health should be grateful for this Report of the Committee on Diagnosis and Pathology of Nutritional Deficiencies, of the Food and Nutrition Board, H. D. Kruse, M.D., Chairman. The committee has brought together the results of a number of dietary surveys and nutritional appraisals during the past 10 years. As stated in the preface of the report, it has been done both for convenient reference and to secure a more proper perspective of the nutritional deficiency problem in the United States. The committee has included also for the first time a considerable amount of dietary survey data previously unpublished.

It will be obvious to the reader, as indicated by the committee, that the surveys show that there is a widespread prevalence of moderately deficient diets and that in addition many factors beside food affect nutritional states. From data secured by new methods, it is indicated that "deficiency states are rife throughout the nation." It is pointed out that this presents both preventive and corrective problems; that effective production and distribution of food must be maintained; that further enrichment of appropriate foods should be considered; and that nutrition education should be extended and intensified.

It is of special interest to the medical profession to read the following concluding comments as to corrective measures: "There is need for detection and therapeutic treatment of deficiency states among the population. For this project it is necessary to disseminate the new diagnostic methods among the medical and public health professions. Foremost among the steps in this direction would be: (1) preparation of a handbook on methods of detecting deficiency states; (2) establishment of training centers for instruction in the medical aspects of nutrition, especially diagnosis of the deficiency

states; and (3) introduction of adequate courses on nutrition, particularly its clinical aspects, into medical schools."

An excellent bibliography of references is included in the report.

GERTRUDE GATES MUDGE

BOOKS RECEIVED

GLOBAL EPIDEMIOLOGY. A Geography of Disease and Sanitation. By James Stevens Simmons, Tom F. Whayne, Gaylord West Anderson and Harold MacLachlan Horack. Vol. 1. Philadelphia: Lippincott, 1944. 504 pp. Price, $7.00.

1944 DIRECTORY OF VENEREAL DISEASE CLINICS. By U. S. Public Health Service. Supplement No. 4 to VENEREAL DISEASE INFORMATION. Revised 1944. Washington: U. S. Government Printing Office, 1944. 59 pp. Price, $.15.

INTERNATIONAL HEALTH DIVISION ANNUAL REPORT FOR 1943. New York (49 West 49th Street): The Rockefeller Foundation, 1943 170 pp. Free from publisher.

INSTITUTIONAL FACILITIES FOR THE TREATMENT OF ALCOHOLISM. By E. H. L. Corwin and Elizabeth V. Cunningham. Research Report No. 7. New York (60 East 42nd Street): The Research Council on Problems of Alcohol, 1944. 85 pp. Free from publisher.

ANNUAL REPORT OF THE DIVISION OF LABORATORIES AND RESEARCH. Albany: New York State Department of Health, 1943. 121 pp.

MANAGEMENT OF THE YOUNG DIABETIC. Prepared for Physicians and Medical Students. By Robert L. Jackson. Iowa City: State Services for Crippled Children. 29 pp.

DIABETES MELLITUS. INSTRUCTION FOR PARENTS. 14 pp. 1943. RHEUMATIC FEVER IN CHILDREN. INSTRUCTION FOR PARENTS. By Robert L. Jackson. 6 pp. 1941. Iowa City: State Services for Crippled Children.

HOME CARE OF BONE AND JOINT TUBERCULOSIS. A Handbook on Nursing Care. Prepared by Iowa State Services for Crippled Children. T. J. Greteman and Alice Miller. Iowa City: State Services for Crippled Children. 43 pp.

A TEXTBOOK OF PRACTICAL NURSING. By Kathryn Osmond Brownell. 2nd ed. Philadelphia: Saunders, 1944. 411 pp. Price, $3.00.

MALPOSTURE AND SCOLIOSIS EXERCISES. A Hand Book for Parents. Prepared by A. Steindler and T. J. Greteman. Illus. Iowa City: Iowa State Services for Crippled Children, 1940. 32 pp.

KEEPING WELL DRAMAS. Baltimore: Baltimore City Health Department, 1944.

A SHORTER HISTORY OF SCIENCE. By William Cecil Dampier. New York: Macmillan, 1944. 189 pp. 9 plates. Price, $2.00.

HEATING, VENTILATING AIR CONDITIONING GUIDE 1944. New York: American Society of Heating and Ventilating Engineers. Vol. 22. 1168 pp. 1944 Roll of Membership 104 pp. Price, $5.00.

PROCEEDINGS OF THE FIFTY-SIXTH, FIFTY-SEVENTH AND FIFTY-EIGHTH ANNUAL MEETINGS OF THE CONFERENCE OF STATE AND PROVINCIAL HEALTH AUTHORITIES OF NORTH AMERICA. Held at Washington, D. C., 1941, 1942 and 1943.

MARRIAGE AND FAMILY RELATIONSHIPS. By Robert Geib Foster. New York: Macmillan, 1944. 314 pp. Price, $2.50.

HEALTH COUNSELING FOR GIRLS. By Margaret Leonard. New York. Barnes, 1944. 131 pp. Price, $1.50.

SPECIAL DELIVERY. By B. D. Rosenberg. Illus. New York: Ziff-Davis Publishing Company, 1944. 96 pp. Price, $2 00.

A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

RAYMOND S. PATTERSON, PH.D.

Correction Please—There is much more in this illuminating statistical study, but here is one observation culled from it that you may want to remember: when the age distribution for 1943 is adjusted (to account for the young men no longer in this country) the apparent increase in the crude death rate from 10.65 in 1940 to 10.87 in 1943 is more than accounted for; the corrected rate shows a decrease of 3.1 per cent instead of the indicated increase of 2.1 per cent.

ANON. Morbidity and Mortality from Specific Causes During 1943 and Recent Preceding Years. Pub. Health Rep. 59, 32:1047 (Aug. 11), 1944.

Vimms, Stamms, Bax, *et al.*—Are you one of the horde of vitamin takers? If so, you will be interested in this comparative table which tells you what you are getting and how much you pay for it. You pay through the nose, no matter what brand you favor.

ANON. Comparative Cost of Vitamin Mixtures. J.A.M.A. 126, 1:29 (Sept. 2), 1944.

Down on the Farm—Sanitary engineers have been listing the needed municipal water and sewage treatment projects, the provision of which would go far toward relieving post-war unemployment. To these urban sanitary needs may be added the rural deficiencies. It seems that there are 5 million country homes that cry for safe water supplies, and that an equal number of sanitary privies are still to be built.

ATKINS, C. H. National Inventory of Needs for Sanitation Facilities. Pub. Health Rep. 59, 30:969 (July 28), 1944.

About One Thomas Parran—For your clipping file, you may want this "popular" article on the U.S.P.H.S. and its Surgeon General, and you may be a bit surprised to find this eulogistic account in a publication which is not given to being overly sympathetic with bureaucrats.

COREY, H. Guardian at the Gates of Health. Nation's Business. 32, 9:36 (Sept.), 1944.

Too Much Bed Rest—When I annotated the item "Bed Rest May Be Lethal" in the June Bibliography, I supposed in my innocence that I was calling attention to the arresting and novel opinion of one intrepid breaker-of-new-ground. Only three months later appears this important symposium which particularizes upon the same idea. These authorities believe that extended rest may militate against improvement in heart disease, after surgery, and for certain neuropsychiatric conditions. And the writers lay no claim to originality in expounding their theses.

HARRISON, T. R. Abuse of Rest as a Therapeutic Measure for Patients with Cardiovascular Disease (and five related papers). J.A.M.A. 125, 16:1075 (Aug. 10), 1944.

Laboratory Intelligence—Experiments with yellow fever cultures lend further confirmation to the assumption that none of the viruses, so far studied, is susceptible to the action of the sulfonamides.

KOPROWSKI, H., and LENNETTE, E. H. Propagation of Yellow Fever Virus in Tissue Cultures Containing Sulfonamides. Am. J. Hyg. 40, 1:1 (July), 1944.

At a Cost of $2.13 per—With the highest, large city syphilis rate among its military selectees, Philadelphia had a big follow-up job to do. The city Health Department had not the requisite staff, so a coöperative project was organized. Each registrant was sent a friendly letter advising him to seek treatment. This did the trick in 2 out of 5 cases. Two weeks later the others received a tough letter which produced results in almost another 1 out of 5. How the 2 remaining recalcitrants were brought to heel is the burden of this paper.

KRESGE, A. M. A Technic of Follow-Up of Selective Service Registrants With Syphilis in Philadelphia. Ven. Dis. Inform. 25, 6:167 (June), 1944.

We Need More Papers of This Kind—So practical and down-to-earth is the advice to the public health nurse about problems she will have to solve in attempting to carry an increased tuberculosis case load that this paper becomes of interest to more of us than the nurses to whom it is directed.

LINCOLN, L. A. Solving Tuberculosis Problems in War Time. Pub. Health Nurs. 36, 8:394 (Aug.), 1944.

Extended Medical and Hospital Service for Industry—This symposium is mostly about the Wagner bill and what industry, industrial medical services, and insurance companies can do to forestall governmental health insurance plans.

MANSON, M. H. What Is Extended Medical Service? (and five related papers). Indust. Med. 13, 8:609 (Aug.), 1944.

Foot Note for the Future—DDT, the valuable, new and as yet unavailable insecticide, was fed in large doses to a variety of farm and experimental animals. The lesions that were produced are described—the most outstanding being tremors in the muscles of extremities.

NELSON, A. A., *et al.* Histopathological Changes Following Administration of DDT to Several Species of Animals. Pub. Health Rep. 59, 31:1009 (Aug. 4), 1944.

Penicillin Gallops to the Rescue—Briefly outlined is the present-day status of the treatment of both syphilis and gonorrhea. If you read extensively in this field, you will find little that is new to you here, but still the condensed summary should prove illuminating.

NELSON, N. A. The Treatment of Syphilis and Gonorrhea as of Today. Am. J. Nurs. 44, 8:737 (Aug.), 1944.

Skin vs. Deep Cancers—This man believes that many inoperable cancers might be prevented by provoking and removing skin epitheliomas. Once more he asks that a commission of experts be appointed to consider his suggestion.

PELLER, S. Race, Stock and Environment in Human Cancer. J. Hered. 35, 6:175 (June), 1944.

Did Deficient Italian Health Service Play a Part in That Country's Downfall?—Though this paper is mostly about the exotic diseases the soldiers will bring home with them, there is much searching consideration given to the effect of the military experience of both medical officers and enlisted men upon the future of medical care and public health. Addressed to a Massachusetts audience, it still has wide applicability.

RUSSELL, F. F. The War and Public Health. New Eng. J. Med. 231, 7:225 (Aug. 17), 1944.

Last Word on Post-Vaccinal Jaundice—Considered most plausible is the hypothesis that the agent causing the lamented outbreak of jaundice in 1942, following yellow fever vaccinations, was the accidental introduction of a virus capable of producing jaundice when supposedly normal human blood was used in the manufacture of the yellow fever vaccine. Serum-free vac-

cine is now practical, so there need be no recurrence of the disease among our troops.

SAWYER, W. A., *et al.* Jaundice in Army Personnel in the Western Region of the United States and Its Relation to Vaccination against Yellow Fever. *Am. J. Hyg.* 40, 1:35 (July), 1944.

Showing Us the Door—It is now plain to all that industrial health is not a social project, nor even a public health project: it is an enterprise of industry and medicine, says the editor in the issue of *Industrial Medicine* that carries a fine symposium on the employment of the sub-standard worker. Any public hygienist who refuses to have the door editorially slammed in his face will find the papers useful. Heart cases, neuropsychiatric workers, the maimed, and those with defective eyes and ears are the objects of consideration.

SHAFER, M. M., *et al.* Who Can Work? Indust. Med. 13. 7:531 (July), 1944.

Insured Medical Care—If you hate the Wagner-Murray-Dingell Bill and all its social implications, then you will dislike this dissertation on health insurance. If the door of your mind is the least bit ajar, you cannot but be impressed with the reasonableness of this persuasive writer. If the bill is defeated, as it is likely to be, for our present Congress is conservative he says, then we may expect another similar bill because the need remains as acute as ever.

SIGERIST, H. E. Medical Care for All the People. Canad. Pub. Health J. 35, 7:253 (July), 1944.

Department of Inner Meaning of Words — Preventive medicine, these writers assert, is commonly restricted to mean the intervention in a limited range of situations in which a specific disease can be warded off or a specific deterioration can be forestalled. The logical culmination of preventive medicine transcends the healing of the sick and becomes the building and maintenance of health. Ways in which the training for these broader goals can be integrated in medical education is the point of this paper.

In the succeeding issue of *Science*, Iago Galdston points to the connotations which unfit the term "preventive medicine" for serving as the name of this new endeavor, and he bravely proposes as a substitute, "eubiotic medicine." Have you a handier handle?

SMITH, G., and EVANS, L. J. Preventive Medicine. An Attempt at a Definition. Science. 100, 2586:39 (July 21), 1944.

ASSOCIATION NEWS

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Public Health Nursing Section

Gertrude Beattie, R.N., 101 N. 4th St., Easton, Pa., Exec. Director, Easton Visiting Nurse Assn.

Anna T. Beckwith, R.N., State Capitol, Helena, Mont., Secy., Montana State Board of Examiners for Nurses

Gertrude M. Church, State Department of Health, Lincoln, Nebr., Director, Div. of Public Health Nursing

Wava L. Dixon, 407 W. Story, Bozeman, Mont., Local Supervisor of Nurses, City-County Health Unit

Margaret E. Hart, 320 Sherbrook St., Winnipeg, Man., Canada, Educational Supervisor, Manitoba Dept. of Health and Public Welfare

Orpha M. LaCroix, 416 Avenue A, Bismarck, N. D., Consultant on Tuberculosis Nursing, State Dept. of Public Health

Hilde R. Marble, 1844 Athens St., Boulder, Colo., Student, University of Colorado

Leona Rubbelke, R.N., Burke Ward Health Unit, Minot, N. D., Supervising Nurse

Alberta N. Shaw, R.N., Box 113, Moscow, Kan., Field Nurse, Kansas Crippled Children's Commission

Epidemiology Section

Katharine R. Boucot, M.D., Herman Kiefer Hospital, Detroit 2, Mich., Resident in Tuberculosis

School Health Section

William H. Bristow, Ed.D., 110 Livingston St., Brooklyn 2, N. Y., Asst. Director, Bureau of Reference Research and Statistics, Board of Education

Louis Hutto, Ph.D., State Department of Education, State House, Augusta, Maine, Director of Health and Physical Education

Leslie W. Irwin, Ph.D., Dept. of Education, University of Chicago, Chicago, Ill., Director of Health and Physical Education

Anna V. Matz, R.N., M.A., 40 East 10th St., New York, N. Y., District Supervising Nurse, Dept. of Health

Arthur H. Steinhaus, Ph.D., U. S. Office of Education, Washington 25, D. C., Chief, Div. of School Health and Physical Education

Douglas B. Taylor, M.A., 700 East 43rd, Austin, Tex., Health Education Consultant, State Health Dept.

Arthur Williams, D.D.S., M.P.H., 1260 Columbia Rd., N.W., Washington 9, D. C., Dentist, Washington Health Dept.

Dental Health Section

R. Duane Hayes, D.D.S., 420 Sixth Ave., N., Nashville 3, Tenn., Dental Officer and Consultant for Middle Tennessee Dental Hygiene Service, State Dept. of Public Health

Sylvia Levy, D.H., 438 Beach 67th St., Arverne, N. Y., Dental Hygienist, New York City Dept. of Health

Maury Massler, D.D.S., 808 South Wood St., Chicago 12, Ill., Supervisor of Dental Services, Research and Educational Hospital

J. Ben Robinson, D.D.S., 618 West Lombard St., Baltimore 1, Md., Dentist

William H. Rumbel, D.D.S., State Dept. of Health, Charleston 5, W. Va., Director, Bureau of Dental Health

Isaac Schour, D.D.S., Ph.D., 808 South Wood, Chicago, Ill., Professor of Dental Histology and Head of Dept., University of Illinois College of Dentistry

Carl L. Sebelius, D.D.S., M.P.H., 420 Sixth Ave., N., Nashville 3, Tenn., Director, Dental Hygiene Service, State Dept. of Public Health

Ernest F. Soderstrom, D.D.S., 409–10 Beaty Bldg., Modesto, Calif., Member, Board of Education, Modesto Elementary School, High School and Junior College

Frances A. Stoll, 630 West 168th St., New York 32, N. Y., Director, Courses for

Dental Hygienists, School of Dental and Oral Surgery, Columbia University

Unaffiliated

Frank C. Comploier, 130-37-227th St., Laurelton, N. Y., Acting Director, Physicians' Service, Lederle Laboratories, Inc.

Captain Samuel B. Goldwasser, Sanitary Inspector, United States Army

Arax Jaboolian, Public Health Library, 125 Worth St., New York 13, N. Y., Librarian

Florence G. McKibben, 44 Stow Lane, Route 2, Lafayette, Calif., Member, Research Committee, Camp Committee, Contra Costa Public Health Assn.

Jessie L. Ruff, 903 North State St., Apt. 5, Jackson, Miss., Administrative Asst., State Board of Health

Szeming Sze, M.B., 1452 Juniper St., N.W., Washington 12, D. C., with Health Division, United Nations Relief and Rehabilitation Administration

DECEASED MEMBERS

W. F. Davison, M.D., Kingston, Pa., Elected Member 1930, Public Health Education Section

Selskar M. Gunn, New York, N. Y., Elected Member 1905, Elected Fellow 1922, Charter Fellow, Unaffiliated

M. B. Owens, M.D., Newport, Ark., Elected Member 1931, Health Officers Section

NEWS FROM THE FIELD

FORECAST OF POST-WAR NEEDS IN SANITATION FACILITIES

According to an announcement by the Division of Sanitary Engineering, U. S. Public Health Service, Washington, there are deficiencies in water supplies, sewage disposal, and other sanitary facilities in many urban and rural areas throughout the United States, which now menace the health of millions and cause huge economic losses. Four studies have recently been completed as parts of a national inventory of needs for sanitation facilities. Needs are presented which include an estimated total of three and a half billion dollars which should be made available as quickly as supplies of labor and materials and other practical considerations permit. These would largely pay for themselves in savings of health and economic losses according to the Public Health Service engineers.

The inventory of rural sanitation needs shows that more than five million rural homes now need new or improved water supplies and that more than five million rural homes—including 846,148 entirely without toilet facilities—need sanitary privies as a minimum. This inventory shows that an estimated 50,000,000 persons or 12,000,000 families, are not now served by public water supplies and that a total of approximately 6,550,000 rural homes are not supplied with running water. The estimate would require about $265,000,000 to provide safe water supplies for the 5,294,000 rural homes which need them. It is further estimated that it would cost about $180,000,000 to provide privies for the new homes now without sanitary facilities and to replace half of the 8,505,572 existing outside toilets, about 50 per cent of which are insanitary.

The inventory of public water supply facilities indicates that new and extended water supply systems costing more than $800,000,000 are needed to serve adequately the 86,000,000 persons who now are served or could be served by public water supply facilities in communities with 200 or more population. Estimates of loss from sanitary and other defects in public water supplies include $24,000,000 from water of excessive hardness, $10,000,000 from water-borne disease, and at least $10,000,000 because of miscellaneous other defects in the quality.

The inventory of public sewage needs in states indicates that there is need for $2,255,000,000 in new or additional sewers and sewage treatment systems for almost 14,000 of the 16,752 communities in the United States. This includes an estimated cost of about $1,200,000,000 for needed new sewer systems and extensions and $1,000,000,000 for facilities to treat sewage and industrial wastes. The Public Health Service engineers estimate that the annual cost of water pollution which would be saved by such investments, would over a period of years very nearly pay for all the sewage treatment needs of every community of more than 200 inhabitants in the United States.

A final study on milk pasteurization needs proposes 438 milk pasteurization plants which would cost an estimated $8,123,500 for 34 states and Alaska. The yearly economic loss attributable to milk-borne disease outbreaks in the United States is at least $3,000,000, mostly due to raw milk. The inventory showed that more than 97 per cent of milk supplies of communities in cities of 500,000 population or more is pasteurized but that less than 25 per cent is pasteurized in communities under 2,500 population.

PLANS FOR STATE HEALTH DEPARTMENT BUILDINGS

Commissioner J. E. Offner of the West Virginia Department of Health is anxious to obtain information concerning plans, specifications, and costs of any building erected within the past five years for the sole use of a state health department.

Similar plans concerning health department buildings proposed for post-war construction would also be helpful in formulating a post-war building program for the West Virginia State Health Department.

If readers can supply any information along these lines, they should communicate directly with Dr. J. E. Offner, State Health Department, Charleston 5, W. Va.

MICHIGAN SCHOOL OF PUBLIC HEALTH APPOINTMENTS

Henry F. Vaughan, Dr.P.H., Dean of the School of Public Health, University of Michigan, Ann Arbor, has announced that Earnest Boyce, M.S., has been appointed Professor of Municipal and Sanitary Engineering in the College of Engineering and Professor of Public Health Engineering in the School of Public Health. Mr. Boyce for many years was Chief Engineer of the Kansas State Board of Health and served as Associate Professor of Sanitary Engineering at the University of Kansas. He has recently been on duty with the Public Health Service as senior public health engineer.

Dr. Vaughan also announced the appointment of John J. Hanlon, M.D., M.P.H., as Resident Lecturer in Public Health Economics, to be associated with Nathan Sinai, Dr.P.H., in that field. Dr. Hanlon received his training at Massachusetts Institute of Technology, his M.D. from Wayne University, and his M.P.H. in 1942 from Johns Hopkins University. For 6 years he was associated with the Detroit Department of Health and then became Health Officer in Bradley County, Tenn., later Director of Nutrition for the Tennessee State Department of Health and Acting Associate Professor of Public Health Administration at the University of North Carolina School of Public Health, Chapel Hill.

The appointment was also announced of Robert Smalley Ingols, Ph.D., as Instructor in Public Health Engineering. Dr. Ingols has been Research Fellow for the Florida Citrus Commission at Winter Haven. He received his Master's degree at Columbia in 1937 and his Ph.D. from Rutgers in 1939. He later served as chemist and research fellow on several water and sewage projects in New Jersey and New York City.

CHILD GUIDANCE CLINIC IN BROWN COUNTY, WIS.

Brown County, Wis., by action of its Board of Supervisors, will employ a psychiatrist to hold a child guidance clinic for the furtherance of mental hygiene. This continues a demonstration program carried on for two years by the Wisconsin State Board of Health. Brown County is said to be the first county in Wisconsin to take steps to inaugurate a mental hygiene program. On the committee are G. M. Shinners, M.D., Health Commissioner, Green Bay, and M. W. Meyer, M.D., District State Health Officer.

MISSISSIPPI STATE BOARD COMMENDED FOR CARE OF PUBLIC HEALTH

The Jefferson Davis County Committee of One Hundred, composed of civic minded Negro citizens of the county, recently paid tribute to the Mississippi State Board of Health and its Director, Felix J. Underwood, M.D., Jackson, for the effective health program carried on for the benefit of all people. According to the *Journal of the American Medical Association*, the

letter acknowledging the tribute was sent to Dr. Underwood because the committee " was especially proud of the local staff whose members are thoroughbreds without exception, competent, efficient, devoted to duty and possessed with a keen appreciation of human personality." According to the letter this agency " is an endorsement of the American way of life and points the way for future action." The Committee of One Hundred is an organization for the general improvement of the conditions of the colored people in Mississippi.

AMERICAN RED CROSS REPLACES NURSING CHIEF

The American Red Cross has announced that Miss Mary Beard, who for the last 6 years has been Director of the American Red Cross Nursing Service, has resigned for reasons of health. Virginia M. Dunbar, who has served as Miss Beard's deputy, will be her successor.

Appreciating the work which Miss Beard has done in war and peace, the Red Cross pointed out her responsibility for the recruitment of 50,000 American nurses who have been added to the Army and Navy Nurse Corps and her work on many of the wartime committees developing the Nurses' Aide Corps and other services. Miss Beard was formerly on the staff of the International Health Division, Rockefeller Foundation.

Miss Dunbar, former Assistant Director of the University of California School of Nursing, San Francisco, has been on the staff of the Red Cross for 6 years and has been identified in planning the home nursing courses now being given throughout the country.

NUTRITION FOUNDATION AIDS RESEARCH

According to the report of Charles Glenn King, Ph.D., Scientific Director of the Nutrition Foundation, Inc., New York, N. Y., the Foundation has appropriated since May, 1942, when its first grants were made, more than $530,000 for studies in the science of nutrition. Studies on the human requirements of specific nutrients received $66,000, studies on the origins and functions of individual nutrients received $134,000, maternal and infant nutrition $26,000, public health problems in nutrition $106,000, educational and professional training $42,000, and nutrition studies related directly to the war $151,000.

METROPOLITAN LIFE PROMOTES PUBLIC HEALTH LEADERS

Among those recently listed for promotions by the Metropolitan Life Insurance Company, New York, were the following, with the new titles:

Donald B. Armstrong, M.D., New York. Second Vice President in charge of welfare.
Louis I. Dublin, Ph.D., New York, Vice President and Statistician.
William P. Shepard, M.D., San Francisco. Third Vice President in charge of welfare work in the Pacific Coast Head Office.

IOWA PUBLIC HEALTH ASSOCIATION

The new officers of the Iowa Public Health Association, elected at the 18th Annual Meeting of that society in May, are:

President—Paul J. Houser, Des Moines
President-elect—C. L. Putnam, M.D., Des Moines
Vice-President—Hazel Roberts, R.N., Manchester
Secretary-Treasurer—Carl F. Jordan, M.D., Des Moines

AMERICAN INSTITUTE OF NUTRITION

According to *Science*, the new officers of the American Institute of Nutrition have been elected as follows:

President—Dr. Icie Macy Hoobler
Vice-President—Dr. William C. Rose
Secretary—Dr. Arthur H. Smith
Treasurer—Dr. E. M. Nelson
Councilors—Drs. Genevieve Stearns, T. H. Jukes, and C. A. Elvehjem

COUNCIL ON RHEUMATIC FEVER

A new organization called the Council on Rheumatic Fever, with offices at 1790 Broadway, New York, N. Y., has been created as a voluntary agency for promoting interest in and attention to rheumatic fever. Among the organizations represented on the Council are:

American Public Health Association
American Medical Association
American College of Physicians
American Rheumatism Association
American Academy of Pediatrics
American Hospital Association
American Nurses Association
American Heart Association

The new group was organized following action taken at a conference held in New York in January, 1944, at which the American Public Health Association was represented by David Rutstein, M.D., Deputy Commissioner of Health, New York City Department of Health, and Reginald M. Atwater, M.D., Executive Secretary, American Public Health Association. According to an announcement by the American Heart Association, under whose leadership the new group was organized, it is hoped that a fund of $50,000 can be obtained within the near future to justify the selection of a director and the employment of an office staff.

Currently about $7,000 is available, with another $5,000 in sight. Negotiations are said to be in progress with officers of the American Legion in the hope that the Legion may accept responsibility for the financial support of the Council on a national scale.

The American Public Health Association will be represented on the Council by Dr. Rutstein and by George M. Wheatley, M.D., New York, N. Y.

FLORIDA OPENS EDUCATIONAL PROGRAM FOR FOOD HANDLERS

An announcement has been made that the Jacksonville Department of Health (Fla.), in coöperation with the state and county departments, have begun "a perpetual food handlers educational program, to include a 12 hour course comprising 6 meetings 2 hours in length and designed to meet the practical needs of food handlers."

MICHIGAN BEGINS FLUORINE-DENTAL CARIES PROGRAM

Grand Rapids, Mich., has been chosen for a control experiment in dental caries under the auspices of the Michigan Department of Public Health, the U. S. Public Health Service, and the University of Michigan School of Dentistry, according to the *Journal of the A.M.A.* The experiment will include the addition of one part per million of sodium fluoride to the municipal water supply to determine whether reductions can be made in dental caries. The plan to add the fluorine to the Grand Rapids water supply was approved by the City Commission. Grand Rapids has been chosen because it has a stable population suitable for study over an extended period.

NEW YORK SYMPOSIUM ON FLUORINE AND DENTAL HEALTH

The New York Institute of Clinical Oral Pathology has announced an open meeting to be held in the New York Academy of Medicine on October 30 at 8:15 p.m. Among the contributors to the subject of Fluorine in Dental Public Health are Dr. Frederick S. McKay, Colorado Springs, Colo.; Dr. H. Trendley Dean, U. S. Public Health Service, Bethesda, Md.; Dr. Wallace D. Armstrong, Minneapolis, Minn.; Dr. Basil G. Bibby, Boston, Mass., and Dr. David B. Ast, Albany, N. Y.

MASSACHUSETTS INDUSTRIAL MENU AND NUTRITION SERVICE

The Massachusetts Division of Occupational Hygiene, in coöperation with the Associated Industries of Massachu-

setts, have begun what is intended to be a weekly menu and nutrition service available to Massachusetts industries.

The service is designed to aid managers of company-operated plant cafeterias by providing a carefully planned menu with suggested meal combinations that are nutritionally adequate and which observe ration allotments. The service facilitates the use of the cafeteria as an effective tool in a nutrition education program. Quindara Oliver Dodge is the Chairman of the Subcommittee on Industrial Nutrition of the State Committee on Public Safety, Boston.

W. K. KELLOGG FOUNDATION CREATES ADVISORY COMMITTEE ON PUBLIC HEALTH

An announcement has recently been made by the W. K. Kellogg Foundation, Battle Creek, Mich., of the appointment of advisory committees in three fields comprising its major interests to evaluate the present programs and activities, review the major financial requests presented to the Foundation, and to develop worth while activities in their respective fields. Committees have been named in public health, hospitals, nursing, education, and libraries. Committees in medicine and in public health engineering are planned.

The Public Health Advisory Committee consists of Wilson G. Smillie, M.D., New York, N. Y., Gregoire F. Amyot, M.D., Victoria, B. C., Henry F. Hemholz, M.D., Rochester, Minn., and Hugh R. Leavell, M.D., Louisville, Ky.

The Hospital Advisory Committee consists of James A. Hamilton, New Haven, Conn., Robin C. Buerki, M.D., Philadelphia, Pa., Basil C. MacLean, M.D., Medical Corps, U. S. Army, and John R. Mannix, Chicago, Ill.

The Nursing Advisory Committee consists of Leah Blaisdell Bryan, R.N., New York, N. Y., Minnie E. Pohe, R.N., Washington, D. C., Ruth B. Freeman, R.N., Minneapolis, Minn., and Lucile Petry, R.N., Washington, D. C.

INDUSTRIAL HYGIENE COURSE AT DE LAMAR INSTITUTE

H. S. Mustard, M.D., Director of the De Lamar Institute of Public Health, Columbia University College of Physicians and Surgeons, New York, N. Y., has announced that the Institute will offer an intensive course in industrial hygiene during the period October 30 to December 6, 1944. According to Dr. Mustard, the course will be so arranged that in any given week instruction will be focused upon one important phase of the subject and the students in the course may register for one or more weeks. The weekly schedule follows:

October	30	Dermatoses
November	6	Dust problems and hazards
November	13	Medical and surgical aspects
November	20	Plasticisers and solvents
November	27	Metals
December	4	Administrative aspects
December	11	Dental problems and services

Persons interested should communicate with the Director, 600 West 168th Street, New York, N. Y.

AMERICAN RED CROSS NAMES DR. DUBLIN TO EXECUTIVE POSITION

Dr. Louis I. Dublin, Second Vice President and Statistician of the Metropolitan Life Insurance Company, has accepted the position of assistant to the chairman of the American Red Cross, according to an announcement by Basil O'Connor, chairman of the Red Cross Central Committee. Dr. Dublin will be on loan from the Metropolitan for a limited period and will devote full time to his Red Cross duties, beginning October 1. These will include among others acting as coördinator of the various operating divisions and serving as liaison between the chairman and the operating vice-chairmen.

"Dr. Dublin has had long experience in public health work," Mr. O'Connor said, "and is almost as well known abroad for his services in that field as in this country. He served the American Red Cross in the first World War as a member of Red Cross commissions in Italy and in the Balkans. He has been President of the American Public Health Association, President of the American Statistical Association, and is now chairman of the board of the American Museum of Health. As Vice President of the Metropolitan in charge of public health relations, Dr. Dublin has taken active leadership in various campaigns for better public health and accident prevention. He has played a prominent rôle in raising the level of public health practices not only in official agencies but also in the operations of the voluntary health organizations."

As head of the Metropolitan's Statistical Bureau since 1911, Dr. Dublin has published many books and pamphlets on public health and on the economics of health. He has been called upon by the heads of many federal and state agencies to make health and economic surveys and to advise on various health projects. He served in 1942 on a commission appointed by Secretary of War Henry L. Stimson to study the operations of the Surgeon General's office, and in 1943 made a similar study for Surgeon General Ross T. McIntire of the Navy.

PERSONALS

Central States

A. C. BACHMEYER, M.D.,† Director of the University of Chicago Clinics, Chicago, Ill., was appointed to conduct a two year survey of America's hospital system at the initial meeting of the Commission on Hospital Care in Philadelphia August 1.

LEONARD C. BATE, M.D., Stambaugh, Mich., has resigned as Director of Iron-Ontonagon County Health Department, effective August 15 to enter private industrial practice.

WILLARD G. BEATTIE, M.D., has been appointed Health Office of Ferndale, Mich.

RICHARD T. CAREY,† formerly with the Technical Department of E. I. Du Pont & Company, has joined the Laboratory Division of the Cudahy Packing Company, Omaha, Nebr.

GEORGE DONALD CUMMINGS, PH.D., M.D.,* has been appointed Director of the Bureau of Laboratories of the Michigan State Department of Health, succeeding the late C. C. YOUNG, D.P.H., who had served as laboratory director since 1919. Dr. Cummings is a graduate of the University of Michigan, Ph.D. 1934, and of Wayne University, M.D. 1943. He has been connected with the Michigan Department of Health Laboratories since 1926, serving in Grand Rapids, Powers, and Lansing. Recently he organized the diarrhea and enteritis study as a joint project of the Health Department Laboratories and the Kellog Foundation. For two years he was Secretary of the Laboratory Section, A.P.H.A.

RALPH J. DORAN, M.D., U. S. Public Health Service, has been appointed to the Dayton Division of Health, Dayton, Ohio, as Venereal Disease Control Officer.

H. G. DYKTOR* has resigned as chief engineer of the Michigan Bureau of Industrial Hygiene, Lansing, after more than 4 years of service, and has been appointed chief of the newly created Bureau of Industrial Hygiene in the Division of Health, Cleveland, Ohio. Mr. Dyktor is Chairman of the Industrial Hygiene Section, A.P.H.A.

* Fellow A.P.H.A.
† Member A.P.H.A.

ROBERT E. FLOOD, M.D., Northport, Mich., has been appointed Health Officer of St. Joseph County, succeeding FREDERICK A. MUSACCHIO, M.D., M.S.P.H., who resigned to accept a similar position in Texas.

SIDNEY I. FRANKLIN, M.D., M.S.P.H.,* Newberry, Mich., has resigned as Director of the Luce-Mackinac County Board of Health.

F. G. GUNLAUGSON, M.D., M.P.H., has been appointed Director of Maternal and Child Hygiene in the North Dakota State Department of Health. Dr. Gunlaugson has been a County Health Officer in Minnesota, and is a graduate of the University of Minnesota in Medicine and in Public Health of Johns Hopkins University.

AWRA A. HOYT, M.D., who served as Health Officer of Battle Creek, Mich., for 24 years, resigned recently.

FRANCIS C. LAWLER, Sc.D.,* Professor of Bacteriology and Immunology, University of North Dakota School of Medicine, Grand Forks, N. D., was elected President of the North Dakota Public Health Association.

CLEMENT E. LOCKWOOD, M.D., Holly, Mich., has been appointed Director of the Alger-Schoolcraft District Health Department, succeeding HENRY H. ASHER, M.D.,† who died recently.

SAMUEL N. MALLISON, M.D.,† has been appointed to the new position of Superintendent of Health of the City of Decatur, Ill. Dr. Mallison will be in charge of the public health work of the city and assume much of the work formerly handled by PIERRE A. STEELE, M.D., City Commissioner of Public Health and Safety.

R. H. MARKWITH, M.D.,* Columbus, Ohio, who for the past 5 years has been Director of Health in the Ohio State Department of Health, has retired at the conclusion of his term and has accepted a position as Assistant Medical Director of the Brown Clinical Laboratory, Columbus, Ohio.

NEAL J. MCCANN, M.D., has resigned as Health Officer of Ishpeming, Mich.

CYRUS P. MCRAVEN, M.D., Macomb, Ill., has been appointed Health Director of McDonough and Fulton Counties, succeeding the late EDWARD L. HILL, JR., M.D. Mount Sterling, Ill.

FRANCIS H. REDEWILL, JR., M.D., M.S.P.H.,† has designed as Health Officer of Sioux Falls, S. D., to accept a position as Venereal Disease Control Officer in the Los Angeles County Health Department, Los Angeles, Calif. His successor is EMIL G. ERICKSEN, M.D.,† who has been assistant to Dr. Redewill.

HUGH B. ROBINS, M.D.,* has been appointed Health Officer of the City-County Health Department in Battle Creek, Mich.

BENJAMIN WHAM, Winnetka, Ill., has been appointed Chairman of the Illinois State-wide Public Health Committee to succeed FREDERIC C. WOODWARD, LL.D., Chicago, Ill.

Eastern States

JAMES A. DOLCE, M.D.,† Health Commissioner at Wilmington, Del., has been appointed County Health Officer at Fairmont, W. Va. His successor is LT. COL. A. PARKER HITCHENS, M.D.

LT. COL. GARFIELD GEORGE DUNCAN, M.C., of Philadelphia, Pa., has been awarded the Legion of Merit by the War Department for his outstanding experimental work on the suppressive treatment of malaria in the Southwest Pacific Area. A native of Ontario, Colonel Duncan was graduated from McGill University School of Medicine in 1923. Prior to entering the service, he was Associate

* Fellow A.P.H.A.
† Member A.P.H.A.

Professor of Medicine at Jefferson Medical College, Philadelphia.

LT. COL. ARTHUR PARKER HITCHENS, M.D.,* Professor of Public Health and Preventive Medicine, University of Pennsylvania School of Medicine, Philadelphia, Pa., has been appointed Health Commissioner of Wilmington, Del.

FRED L. MOORE, M.D.,* who has been Director of the Division of Public Health Studies of the Commonwealth Fund, New York, N. Y., has been appointed to the newly established professorship of Social and Environmental Medicine in the Department of Preventive Medicine and Community Health, Long Island College of Medicine, Brooklyn.

LOUIS H. PINK, President of the Associated Hospital Service of New York, has been elected a member of the Board of Directors of the Visiting Nurse Service of New York. Mr. Pink is the author of a recent book, *Freedom from Fear.*

CAPTAIN THOMAS E. SHAFFER, M.C., U. S. Army, of New Haven, Conn., has recently been assigned to the Infectious Disease Control Branch of the Epidemiology Division, Preventive Medicine Service, Office of the Surgeon General, Washington. Capt. Shaffer is a graduate of Cornell Medical College in 1932 and was an instructor in pediatrics at Yale University School of Medicine in civil life.

LIEUT. R. S. TAGGART, M.D., formerly District Sanitary Engineer for the New York State Department of Health, has been appointed to a post in pest control work in the Preventive Medicine Service, Office of the Surgeon General, Washington, succeeding CAPT. D. F. SMALLHORST, SN.C.,† who has been assigned overseas.

FREDERICK A. WOLL, PH.D.,† Professor of Hygiene at the College of the City of New York and Director of the Department of Hygiene, has retired at the age of 70.

Southern States

OTTIS L. ADER, M.D., Walkertown, N. C., has been named Director of the Venereal Disease Clinic of the Durham City-County Health Department, succeeding ROY H. MCDOWELL, M.D., Dunham, N. C.

WILLIAM O. BINGHAM, M.D., Roan Mountain, Tenn., has resigned as Health Officer of Carter County.

PAUL BRINDLEY, M.D., Professor of Pathology, University of Texas School of Medicine, Galveston, Tex., recently returned from a hospital tour in Costa Rica, Guatemala, Honduras, and Mexico City, where he had been making special studies in tropical medicine under the auspices of the John and Mary R. Markle Foundation.

MARION MURPHY BROOKE, SC.D., Associate in Parasitology at the School of Hygiene and Public Health of the Johns Hopkins University, Baltimore, Md., has been appointed Associate Professor of Preventive Medicine at the University of Tennessee College of Medicine, Memphis, Tenn.

LT. COL. MARTIN A. COMPTON (MC), has been appointed a member of a board of the Office of the Surgeon General, Washington, D. C., the purpose of which is to prepare, develop, and implement the medical portion of the War Department's program for aid to civilian populations in liberated countries. This board was established in June, 1943.

JAMES P. CROLEY, M.D., Plymouth, N. C., has resigned as head of the District Health Department serving Tyrrel, Hyde, and Washington Counties.

EDWIN F. DAILY, M.D.,* Director of

* Fellow A.P.H.A.
† Member A.P.H.A.

the Division of Health Services of the Children's Bureau, U. S. Department of Labor, Washington, D. C., has been granted leave to serve with the Army of the United States to assist in reëstablishing civilian medical and hospital services in some of the liberated countries.

JUDSON D. DOWLING, M.D.,* Sr. Surgeon, USPHS (R), Birmingham, Ala., has been assigned to the New Mexico Department of Health, Santa Fe, as Assistant State Director of Health.

ROBERT B. C. FRANKLIN, M.D.,† Mount Airy, N. C., has resigned as Health Officer of Surry County to enter military service.

JOHN C. HUME, M.D., U. S. Public Health Service, who has been serving as Venereal Disease Control Officer at Wilmington, N. C., has been detailed as Acting Director of the Bureau of Venereal Disease of the West Virginia Department of Health.

ERNEST W. PROTHRO, M.D.,† has been appointed Acting Officer of the Laredo-Webb County Health Unit, Austin, Tex., succeeding Arthur E. Ballard, M.D., who resigned to take a similar position at Belton, Tex.

PASSED ASST. SURGEON (R) ROBERT M. ROBBINS, M.D.,† formerly Director of the three northwestern county health departments of Walton, Okaloosa, and Holmes, Florida, has been transferred to Georgia and appointed as Asst. Commissioner of Health in the Macon-Bibb County Health Department, Georgia, as of August 1.

LT. COL. E. S. A. ROBINSON, M.C., A.U.S.,* Director of the Laboratory Division in the Office of the Surgeon General, has been appointed to serve on the American Red Cross Subcommittee on Blood Derivatives and Plasma Fractionation.

JACOB LELAND TANNER, M.D., has resigned as Health Officer of Mercer County, Ky., to enter private practice of medicine in Henderson, Ky.

A. L. VAN HORN, M.D., has been appointed Director of the Division of Health Services of the Children's Bureau, Washington, D. C., to succeed EDWIN F. DAILY, M.D.,* who is on leave to serve with the Army of the United States.

LT. COL. THOMAS G. WARD, M.C.,† has been appointed Director of the Epidemiological Division of the Preventive Medicine Service, Office of the Surgeon General, Washington, succeeding LT. COL. ARTHUR P. LONG, who has been assigned to overseas duty. Colonel Ward is a graduate of Baylor University in medicine and has received the M.P.H. and Dr.P.H. degrees from Johns Hopkins University. He recently received the Legion of Merit award in recognition of outstanding services.

Western States

MILDRED T. WOOLLEY, DR.P.H.,† formerly Director of the Arizona State Laboratory, has been appointed Director of the Long Beach City Public Health Laboratory, Long Beach, Calif.

Foreign

BRIGADIER GENERAL WARREN FALES DRAPER, M.D.,* Chief of the Public Health Branch of Civil Affairs in the European theatre, was promoted by the Army to Major General, as announced by Supreme Headquarters in August.

ALFRED L. FRECHETTE, M.D., M.P.H.,† has returned to Concord, N. H., and has resumed his duties as State Health Officer after service as Surgeon with the U. S. Public Health Service in Africa.

* Fellow A P H A.
† Member A P.H A.

Panama

PVT. ANATOLE SOLOW,† on duty with an Engineer Topographical unit in the Panama Canal Department, has received a letter of commendation from Lt. Gen. George H. Brett, Commanding General, congratulating him on the manner in which his lecture of July 26 on "Post-War Housing and City Planning" was received by the Panama Canal Natural History Society.

CLARENCE H. WARING, M.D., Medical Director, U. S. Public Health Service, has recently succeeded HENRY A. HOLLE, M.D.,† as chief quarantine officer of the Panama Canal Health Department.

Venezuela

MILTON LOPEZ HENRIQUES, M.D., Director of Local Health Services for the Ministry of Health of Venezuela, is spending two months with the State Health Department of Kentucky under the auspices of the Rockefeller Foundation.

Death

LOUIS A. JULIANELLE, PH.D., of 234 Mamaroneck Road, Scarsdale, N. Y., Chairman of the Division of Infectious Diseases of the Public Health Research Institute of the City of New York, Inc., since 1942, died on August 12.

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CONFERENCES AND DATES

American Academy of Ophthalmology and Otolaryngology. Chicago, Ill. October 8–12.

American Dietetic Association—27th Annual Meeting. Palmer House, Chicago, Ill. October 25–27.

American Water Works Association—
- Southwest Section—Hotels Stephen F. Austin and Driskill, Austin, Tex. October 17–19.
- Missouri Valley Section—President Hotel, Kansas City, Mo. October 23–24.
- California Section—Biltmore Hotel, Los Angeles, Calif. October 24–26.
- West Virginia Section—Chancellor Hotel, Parkersburg, W. Va. October 26–27.
- New Jersey Section—Atlantic City, N. J. November 2–4.
- Four States Section—Benjamin Franklin Hotel, Philadelphia, Pa. November 8–10.
- Virginia Section—John Marshall Hotel, Richmond. November 14–15.
- Florida Section—Suwanee Hotel, St. Petersburg, Fla. November 16–18.

Association of Military Surgeons of the United States. Hotel Pennsylvania, New York, N. Y. November 2–4.

Civil Service Assembly—Conference on Public Personnel Administration. Chicago, Ill. November 1–3.

Federation of Sewage Works Associations. William Penn Hotel, Pittsburgh, Pa. October 12–14.

Florida Public Health Association. Gainesville, Fla. December 4–6.

Institute of Medicine of Chicago—Postgraduate Assembly on Nervous and Mental Diseases and War. Palmer House, Chicago, Ill. November 1–2.

Michigan Public Health Association. Grand Rapids, Mich. November 1–3.

National Chemical Exposition—Sponsored by the Chicago Section of the American Chemical Society. The Coliseum, Chicago, Ill. November 15–19.

New England Industrial Nurses Association and Institute on Industrial Nursing—29th Annual Conference. Hotel Statler, Boston, Mass. October 13–15.

New York Institute of Clinical Oral Pathology. New York Academy of Medicine. Hosack Hall. October 30.

Pennsylvania Sewage Works Association—Seventeenth Annual Conference. William Penn Hotel, Pittsburgh, Pa. October 12–14.

U. S. Public Health Service—National Conference on Post-war Venereal Disease Control. St. Louis, Mo. November 9–11.

American Journal of Public Health
and THE NATION'S HEALTH

Volume 34 November, 1944 Number 11

Public Health as an International Problem*

RAYMOND B. FOSDICK, LL.D.
President, The Rockefeller Foundation, New York, N. Y.

WE are meeting tonight in the midst of a cataclysm more ruthless, barbarous, and destructive than anything the human race has ever experienced. Military victory now seems assured, but the residual problems which this war will leave in its wake far transcend in difficulty and ominousness the problems which we have thus far faced. It is one thing to win a war; it is quite another thing, as we found in 1919, to win a peace. This war has unloosed hatreds and the desire for revenge so intense and so widespread that they will smolder long into the future. The evil consequences of what mankind has done in the last five years will be alive in the world when our children's children are carried to their graves.

Moreover, we know now, as we did not know in 1919, that modern war and modern civilization cannot survive on the same planet. We cannot keep both. One or the other has to go. We cannot have robot buzz-bombs and public health in the same world. We cannot develop the destructive powers of physics and chemistry as they are being developed now and at the same time keep our schools and hospitals and cultural institutions intact. The bridges over the Arno in Florence are gone. How could we expect otherwise when men take dynamite and TNT into the heart of Florence?

As we look into the future the picture is frankly frightening. Let us not minimize it, or dismiss it with facile optimism. It is a picture of expanding physical power, of mankind armed to the teeth with increasingly destructive weapons as science and technology go forward on their triumphant march. We are faced with a question which we cannot dodge: Can that science and that technology be brought under control? Is man to be the master of the hurricane forces which he is creating or is he to be their victim? If science were standing still, if no new powers were to be added to those already in man's possession, the problem might eventually find solution. But, of course, the idea is fanciful. We are merely at the beginning of progress in our technologies. Physics and chem-

* Presented before the American Public Health Association at the Seventy-third Annual Meeting in New York, N. Y., October 3, 1944.

istry have barely got started in showing us what force really means. New powers and weapons are just around the corner, powers and weapons which the utmost wisdom could scarcely be trusted to use aright—airplanes larger, faster, and more deadly than those now employed, explosives capable of far-flung destruction beyond anything we dream of at the moment. How are we going to use these airplanes and explosives? How can we reconcile them with the progress and happiness of mankind?

Some years ago the organization with which I am connected—The Rockefeller Foundation—built a school of public health in Warsaw for the training of public health personnel. It is gone now—obliterated in the fraction of a second by a single high-power bomb. We built a school of hygiene and tropical medicine in London. The whole side of it, including the library, has been blown up. We built institutes of public health in Sofia and Budapest and Zagreb and Bucharest. Whether there is anything left of them today, we do not know. We built a library at the University of Nankai. It is completely demolished—not one stone left upon another. We built in Peiping the finest teaching hospital and medical school in all Asia. Whether any part of it will survive when the Japanese withdraw is anybody's guess.

But this is just bricks and mortar. Look at the situation from the standpoint of personnel and the training of intellectual leadership. For years The Rockefeller Foundation has been supporting work in the physical and social sciences at the University of Leyden in Holland and the three Czech universities of Prague, Brno, and Bratislava. Five years ago the Germans closed all these institutions and many of the professors and students were arrested and shot. Similarly the five Polish universities were closed, some of them were destroyed and their faculties were dispersed and slaughtered. The University of Oslo in Norway must also be added to the list of bloody casualties. In France the University of Strasbourg, the Institute of Ethnology, and the Center for the Study of Foreign Affairs in Paris are only a random sampling of the institutions with which the Foundation has had a long connection and which have been suppressed with violence. In China what has happened to schools and universities is a story of brutality for whose counterpart we would have to go back to the Dark Ages.

What does it all mean? Are the efforts of one generation to be wiped out by the hatreds of the next? Must mankind look forward to having its schools periodically destroyed, its homes and cultural achievements periodically obliterated—with nothing that we cherish safe from peril, with no bridges over the Arno that can be guaranteed against human violence?

This is the kind of future we face. This is the problem that awaits us when the fighting is done. What are we going to do about it? We cannot go on as we have. Mankind has at long last come to the end of a road.

The answer is obvious, and it lies in the tentative beginnings that are now being made at Dumbarton Oaks. This country and the other countries of the world are confronted with a great decision, an insistent demand for the exercise of human intelligence on an unprecedented and daring scale. That decision calls for nothing less than the organization of the family of nations into an effective working unity. It means that we must marshal on the side of peace and fair play all the constructive resources to which access can anywhere be had—spiritual resources, educational resources, the common hopes of people in all countries, the ties that bind the human race together

across boundary lines, the innate decency of the masses of mankind when freed from perverted leadership, the hunger of plain men everywhere for justice and truth if only someone will tell them what they are.

This great effort to build defenses against our own violence cannot be a patch job. There is nothing now left to patch. It calls for bold and daring construction. We must be fearless in our devising, ready to scrap the shibboleths and catchwords about nationalism and sovereignty which betrayed us in 1919 and which for a century have cluttered up our thinking. We must be prepared for sacrifice, for nothing worth while is ever gained without it, and no nation can bargain itself into security. We must be ready to pool resources and assume responsibilities on a scale that will run counter to traditions and techniques which have long been cherished. In brief, we must be prepared for ideas and practices that may seem to some of us revolutionary, for the robot buzz-bomb is revolutionary and the new explosives that are on their way are revolutionary, and unless we meet revolution with revolution, we shall find ourselves overwhelmed by forces which are out of control.

The danger is that we shall do too little, that we shall be fearful of making too many concessions, timid about venturing too far, that we shall whittle away a strong plan in an attempt to compromise with a weak one, that we shall try to ward off a hurricane with merely a windbreak. Already voices of caution are being raised, and we are being warned that there are some steps that the United States cannot take without too violent a break with tradition. One of our more prominent columnists is talking about "the folly of challenging an ancient and cherished prerogative." But the robot airplane is challenging civilization itself and the possibility of decent human life on this planet; and that, it seems to me, is far more important than the preservation of a cherished prerogative. Give us another ten years in the development of robot bombs and rocket guns and there will be precious few prerogatives left to anybody.

I do not have to suggest that the great decision which we and the other nations must make in the near future is bigger than any question of politics or partisanship. Any person or any group that tries to gain selfish advantage from this attempt to put international relationships on a stable basis is guilty of a crime which history will never condone. Let us be frank about the matter: We bungled a unique chance in 1919; this may be the last chance we shall have. What we do in this generation may well decide the kind of civilization, if any, which is to dominate the globe for centuries to come.

But what has all this to do with public health? In answer, I would say that no legal plan, no fixed formula, can by itself guarantee that the world will not be torn to pieces whenever passion and emotion gain the upper hand. The community of nations has got to have a kind of intellectual and spiritual integration before it can be absolutely sure that the forces of violence are under control. Consequently there must be developed for international life new areas and techniques of coöperative action which will fit the facts of the era upon whose threshold we are now standing. We need rallying points of unity, centers around which men of differing cultures and faiths can combine, defined fields of need or goals of effort in which by pooling its brains and resources the human race can add to its own well-being. Only as we begin to build, brick by brick, in these areas of common interest where coöperation is possible and the results are of benefit to all, can we erect the ultimate structure of a united society.

I think of public health as one of these rallying points of unity. Health is something that all nations desire, and no nation by the process of gaining it takes it away from another. There is not a limited supply of health for which nations must compete. Rather, every nation by promoting its own health adds to the better health of other nations, just as by assisting in the public health efforts of other nations we protect ourselves. Here in brief is a field of common interest to the race of man everywhere on the planet. Interpreted in broad, positive terms to embrace physical, mental, and moral fitness, it can be a nucleus of international activity which will encourage emulation in other and more difficult fields. What the League of Nations did in Geneva through its International Health Organization can be the starting point and basis of a far broader and better supported work. A world-wide epidemiological intelligence system, the standardization of biological products, the organized exchange of public health personnel to broaden the technical outlook and stimulate the imagination of health officers, the supplementation of public health activity in countries where it is inadequate, the development of minimum standards of acceptable public health work that can be applied on a world-wide basis, the creation of commissions of experts and international conferences on such subjects as malaria, yellow fever, rabies, nutrition, housing, rural hygiene, physical education, social security—these are only samplings of the activities which could profitably be pursued, perhaps on a regional basis, by a new International Health Organization. Activities of this type could develop new habits in international relationships. They could dig new channels of thought and establish fresh methods of approach. They could lead the way in showing the countries of the world, now separated by hatreds and passion, what it means to play ball together.

* * *

Perhaps I have given the impression that the chief purpose of these activities in public health is the stimulation of an international unity which will save the world from shipwreck. That that objective is a challenging and fundamental aspect of public health work on an international scale I do not deny. But work in public health which disregards flags and boundary lines has become in our generation essential to the safety of the human race everywhere. We cannot have airplanes crisscrossing the world from every direction in the space of a few hours' time and expect to keep our old ideas of territorial sovereignty and our old methods of quarantine. Those ideas and methods have suddenly become obsolete. Public health can no longer be thought of exclusively in national terms. In a world as closely knit as ours, what menaces one country menaces all, whether it be disease or economic disaster.

Take, for example, the yellow fever situation. As you know, there has never been any yellow fever in India or in the Orient, although the chief carrier of yellow fever, the *Aedes aegypti* mosquito, is everywhere present there. Consequently no immunity against the disease has been built up, as it has been in continents like Africa and South America where yellow fever has long been prevalent. A country like India is therefore a tinderbox, ready for a conflagration of cataclysmic proportions. It would take only a single infected mosquito to break down all the barriers of quarantine, vaccination, and medical vigilance; and the airplane is ready at hand, able to carry insect passengers just as it carries human passengers. No nation by its own acts alone can protect itself from such an overshadowing menace. It requires united, coöperative action in

which boundary lines are overlooked and conceptions of sovereignty are relegated to the limbo of forgotten things.

The gambiae mosquito furnishes us with another classical illustration. Its home, as you know, is the African tropical belt, extending from the southern border of the Sahara Desert to the Zambesi River. For centuries it has been the scourge of Central Africa, a carrier of a serious and often fatal type of malaria. Until 1930 this mosquito was unknown on this side of the Atlantic. But a new line of planes began to bring passengers to Brazil and there was nothing to prevent the gambiae from coming along, too. And the gambiae came, with results so destructive that even today the terror of that visitation is deeply engraved on the memories of the inhabitants of northeastern Brazil. It took years of effort and millions of dollars to eradicate the species from its new home, but that result was finally accomplished, and it was hoped that the fumigation of incoming planes would prevent another incursion. But that hope was in vain. Last year live gambiae mosquitoes were found in dwellings near the Natal airport, and the beginnings of another conflagration were in the making.

Thanks to the efforts of the Brazilian and United States authorities, the immediate situation is now in hand. But it poses a problem of larger significance which cannot be evaded. The safety of the Western Hemisphere, now within a few hours' flight across a narrow ocean, can no longer be left to the uncertainties of a flit-gun campaign. If the Americas are to be protected adequately, the breeding places of gambiae, wherever in Africa or elsewhere they may be found, must be eradicated or controlled. The campaign must be carried to the sources of infestation. It can no longer be defensive; it must be offensive.

That campaign is now under way—at least the beginnings of it. Brazilian health representatives have been in West Africa, and American representatives are there today. Shades of the isolationists of 1919! What business has our official medical personnel in West Africa? Why can't we stay home and mind our own affairs? The answer is that this newly made world which the airplane has tied together has lost its frontiers. Whether we like it or not, the propinquity of modern life now confronts us with inescapable demands for new techniques. We are living in the 20th century and we cannot retrace our steps back into the 19th. For better or for worse we find ourselves in an era in which our only hope of survival lies in collaboration across boundary lines.

May I give one more illustration of the international character which public health must assume in this new world? The war is going to bring China into the forefront among the nations. A long and distinguished civilization and a great people are at last about to take their place among the leading forces of the world. In the near future, as soon as the war is over, the relations of the United States and the other nations with China will be close and intimate. We shall sell to her our refrigerators and farm machinery in exchange for the goods and services which she will provide; and easy access by plane and ship will promote the flow of ideas and cultural contributions back and forth across the Chinese border.

But China has a total of 658 hospitals for 460,000,000 people. In the United States there are more than 6,000 hospitals for 130,000,000 people. In China there is one well trained physician for every 70,000 of the population, whereas in this country there is one physician for every 750 of the population.

Even these figures only partially in-

dicate the magnitude of the need, because they do not take into account the fact that in China disease is so much more prevalent than it is here, and the conditions favoring its development are so much more acute.

Let us glance at some of the figures. Cholera is reported every year in China; there were 100,000 cases in 1932, 65,000 cases in 1942, 17,000 cases in 1943. Bubonic plague had approximately 6,000 cases in 1942. It is estimated that there are about 6,000,000 cases of dysentery annually, 90 per cent bacillary, 10 per cent amebic. The estimated number of cases per annum of typhoid fever is 700,000; of smallpox, 500,000; of diphtheria, 360,000; of scarlet fever, 180,000. Epidemic meningitis is estimated at 100,000 cases per annum; malaria, 21,000,000 cases per annum; schistosomiasis, 10,000,000 cases per annum. Active tuberculosis is estimated at 36,000,000 cases, 8 per cent of the population. Under-nutrition is so widespread that no figures of any kind are available.

Here is a country about to be linked by intimate ties with the rest of the world. Airplanes will establish new contacts and new trading centers at a thousand different points. The flow of goods and personnel will be a constantly rising tide. Does anyone say that the rest of the world has no legitimate concern and no responsibility for the health conditions of China? From now on, we shall be living in growing intimacy and increasing contact with those health conditions. I am not talking about charity, although I assume that this virtue is still valid. I am talking, rather, about the problem of trying to maintain a healthy life for ourselves and our children side by side with disease as rampant as it is in China. I wish that those who speak so glibly of "globaloney" could see this picture of the international aspect of public health. In attempting to be hard-boiled and realistic they succeed in being merely unintelligent. The Levites of this world no longer have the option of passing by on the other side. They do so at their peril. In this interrelated civilization compassion for the man who falls among thieves has become an inescapable necessity. Whether it is malaria or cholera or plague or tuberculosis or whatever the disease may be, the nations of the world face these enemies of mankind not as isolated groups behind boundary lines but as members of the human race projected suddenly into a frightening propinquity. We did not plan it this way, and science did not plan it this way. We wandered unwittingly into this situation. But here we are—all nations and races jammed together into a single community, tied together by bonds which cannot now be severed. It is indeed one world—one future—one destiny.

* * *

Perhaps I have elaborated the thesis at too great a length. In a word, it leads to this conclusion: The day has passed when any one nation can live unto itself. It cannot even die unto itself, for the whole world would then be chained to a body of death from which mortal infection would flow to the rest. The hour for decision has come. Indeed it came twenty-five years ago and we are very late. We who are interested in public health have a challenging opportunity to lead the way, to lay one of the cornerstones of the new structure, to develop the thinking that must be done in expanding geographical terms, to serve the larger loyalties which must underlie this new world if it is to keep abreast with the facts of the 20th century.

Local Responsibility in Public Health Administration*

JOHN J. SIPPY, M.D., F.A.P.H.A.

District Health Officer, San Joaquin Local Health District, Stockton, Calif.

WHEN Dr. Underwood, in completing the duties of the President of the American Public Health Association, comes to the close of this three day conference and relinquishes the gavel, he will appear in a typical rôle, namely that of a state health officer indulging in the pastime of transferring an added responsibility to a local health officer. On that topic, you should know, we local health officers are given to more or less chronic grouching. We never weary of moaning about the multiplicity of new activities and duties which federal and state bureaus of health prescribe for us.

Perhaps, because our days are rounds of endless trivialities, which limit our horizon and obscure our perspectives, it is difficult for us to envision the panorama of purpose and plan of the general staff of nation and states, whose overall recognizance and knowledge of all sectors permit the planning and direction of our activities in coördinated fashion. We realize of course that a sound physical status for all of our population is a first requisite of national defense, and that each of our communities, as a part of the whole, must exert itself to insure this status. Nevertheless, at times we entertain fancies that we are the victims of an unfair division of labor, funds, and personnel.

We complain of the demands of increased population. Had normal conditions prevailed since 1940, some three or four millions of people would have been added to our local responsibilities. Instead, some twelve million persons in the armed forces, for whose health and welfare the federal government has assumed responsibility, have been subtracted from our concern. If, in certain areas where industries pertaining to the war effort have been intensified, there is some justification for complaint of the population overload, then it must follow that in many other areas there is population loss and one might expect lessening of local public health demands. In addition we must not forget that industry itself has assumed responsibility for the maintenance of health of several millions of workers who were formerly dependent on public agencies for health protection. One might mention other reliefs in population demands upon us. It is not, therefore, increased population of which we have a right to complain.

We speak of new public health problems. I doubt if we mean that, for on analysis, with only minor exceptions, there are no new problems. There are only new facets of old problems. Always mothers have had babies, always children have suffered from childhood infections, always large numbers of persons have been malnourished. Always, too, women have engaged in manual labor, and the fact that they have been

* Presidential Address delivered before the American Public Health Association at the Seventy-third Annual Meeting in New York, N. Y., October 3, 1944.

transplanted from the drudgery of home and field to the mechanical processes of industry does not necessarily bespeak greater physical hazards or deterioration. What we do mean by new health problems is only a clearer recognition of old ones and a call for greater application of effort toward solution of them.

Several decades ago it was obvious that national and state public health agencies were not in position to apply public health measures in practical manner. To explain, it has been said that public health is the sum total of the health of individuals. The education which produces it is therefore something which cannot be supplied to the populace in carload or truckload lots from national or state capitals. It must be dispensed to individuals in ounces, drams, and drops, and its dispensing to those who need it must be insured. This must be done by the local agency who can know how, when, and where individuals can be reached, and who can inspire the local community to want and to support facilities necessary to its general health preservation. It cannot be done in strict accord with any set pattern, for each community has its own characteristics and customs which no transcendentalism or government fiat may affect. It must come from local, voluntary reaction.

Our states are made up of various units of local government. Our democratic form of government presumes that these shall be granted every privilege of local self control, and it is only when they fail to exercise it properly or when they infringe upon the rights of other units that the state is justified in intervening. This is as true in the preservation of public health as in the preservation of law and order. More so, for since communicable infections have no respect for political boundaries, and since no unit may tolerate the prevalence of contagion within its jurisdiction without endangering the health and lives of citizens of adjoining units, it is more than a privilege of local control; it is a duty which the state must insist be performed. It has insisted by enacting legislation granting to the various units police powers for the protection of the public health and making it mandatory that they exercise these powers.

This mandate however often fails to envision the whole of the modern public health movement and, for the most part, applies only to the control of communicable diseases or of insanitation. While few local units wilfully evade it, there are far too many which have failed, either through apathy or lack of means, to provide proper facilities for carrying out their obligations, secure in the belief that they may in emergency rely upon state agencies.

Lack of means is the greater deterrent of the two and is often more imaginary than real, for while we public health workers may clearly realize justification for public health expenditures it is not easy for many taxpayers to do so. We are irked by their lethargy and impatient with their delay in acceptance of our promises of the benefits of efficient health services, forgetful of the old adage concerning persons " convinced against their will " and that it is only through their spontaneous conviction and coöperation that the services we propose will be utilized.

Sometimes such communities are convinced by emergency, sometimes by demonstration. The basis of the demonstration method, originated by voluntary organizations and by several of the foundations interested in stimulating public health procedures, is that of a financial incentive or grant-in-aid for a temporary period. By reason of many successful demonstrations it has become a federal philosophy which promises complete permanency. A grant-in-aid for public health purpose in those communities burdened by activities of

national import, the cost of which should be distributed over the whole nation, appears most justifiable. Likewise it appears a necessity in those communities with actual lack of means. Perhaps we can agree that it serves a useful purpose in broadening the scope of activities of all public health departments until these activities become accepted as a local responsibility or until local means of support become available. We may also agree that its use can result in a general uplift of public health standards, even though it may be debatable as to whether all communities require or demand the same quality or quantity of such services.

It is very easy for those of us who have had to contend against the old-time penuriousness in public health expenditures to become overly enthusiastic about grants-in-aid. But already state health officers are rumoring that formerly self-reliant communities are substituting these grants for tax funds previously levied for support of many local health activities in order to divert such tax funds to other purposes; that other communities threaten to discontinue proven, needed activities if grants-in-aid are not forthcoming; that still others are demanding these grants, not as a need, but as a right.

There is evidence that in some communities these grants are encouraging public health patterns much too large for the cloth and in excess of the community needs and resources. There is also the attendant danger that because of their source, local taxpayers feel no concern as to the manner in which they are expended, a fact which may lead to extravagances and waste, discrediting the wisdom of all public health expenditures and the business prudence of health officials. We as friends of public health progress must insure that a grant-in-aid shall be used only as a gentle stimulant and not as a narcotic which soothes its victim to complacency and contentment while its effects last, and sends him into collapse when it is withdrawn.

That, thus far in the dispensing of these grants, there has been no grave evidence of usurpation or obnoxious autocratic direction of local health activities, has been due to the integrity and sincerity of federal and state officials who administer them. It must be remembered however that present policies may fluctuate and in this fluctuation there is inherent danger. The power to give implies the power to take away. If we in local communities permit ourselves to become so wholly reliant upon these grants that withdrawal of them means catastrophe to our cause, it means that we may yield to centralized bureaucratic control. While this may be for our betterment, it is repugnant to our democratic ideas and ideals.

Much depends therefore on the degree to which we permit our communities to become dependent upon these grants. They do not depend upon them for support of their public schools or fire and police departments. Is protection of the public health a lesser responsibility? Our public health education can be regarded as failure if it cannot teach our people the value of community supported and controlled local health activities which meet their wishes and supply their needs. Neither individuals nor communities can continue to accept unwarranted contributions without sacrifice of character. We too must anticipate the possibilities of ultimate readjustment and reconversion.

A Coördinated School Health Program

MAUD A. BROWN

Director of Health Education Service; State Board of Health, Helena, Mont.

IN organizing or reorganizing a program of community health education it matters not from what field the initiative comes, the promotion inevitably will devolve upon the group stronger in local leadership.

In Lewistown, Mont., this meant the schools since there was at the inception of the program no organized health department in the sense that it now exists as a County Unit. The school system on the other hand had for two generations been a compactly organized and authentic factor of community living. This advantage being coupled with a fortuitous leadership in the school administration, it is not difficult to understand that the present County Health Unit, strongly educational in character, grew out of the school interest in health education.

That this incursion of education into public health education is not resented was indicated by the election of C. G. Manning, Superintendent of the Lewistown Public Schools, as President of the Montana State Public Health Association, following an address telling of the program briefly described in this article. The President of the State Medical Association voiced the approval of his group "without reservation, of the principles and procedures involved." It would seem that real coördination is in sight.

Lewistown is a central Montana city of some 6,000 people. It is the county seat of Fergus County and the center, professional, educational, and commercial, of a large ranching area, extending well beyond the boundaries of the county. Fergus County itself covers an area of 4,250 square miles, about the size of the state of Connecticut, giving each of its 8,000 citizens outside the county seat, on the average, half a square mile of territory.

The program here described was developed in coöperative planning with the Health Education Service of the Maternal and Child Health Division of the Montana State Board of Health.

The planning began, to quote Superintendent Manning, "with progress in our own thinking," the outcome of this thinking having been the shifting of focus to functional health of the individual child and the recognition that this can be achieved only by way of the home, which in turn is conditioned by the total community environment.

In making plans for this vitalizing and socializing of the school health program the least privileged communities were kept ever in mind and problems and procedures reduced to the lowest possible terms. But never below the irreducible minimum of health essentials.

The preliminary planning involved three steps: (1) identifying these irreducible minima of healthful living; (2) determining whether these essentials fall within the resources of an ordinary school system in an average community; and (3) deciding what changes in the existing local school situation were necessary to make school living really a continuous optimal experience.

When faced squarely, pencil in hand, ruthlessly setting down in two categories those practices "essential to

health" and those "not *essential* to health" (although perhaps socially desirable), the column of essentials emerged reassuringly short:

1. Food, clothing, and shelter which are health permitting
2. Protection from physical hazards of disease and accident
3. Protection from mental and emotional hazards

No one was willing to concede these to be out of reach of the American child in general, or the Lewistown child in particular.

COMMUNITY ENVIRONMENT

The first problem then became: Can Lewistown provide adequate food, clothing, and shelter for its children and protect them from physical and social hazards? This involved a study of the social structure of considerable significance. The findings were set forth graphically by means of the Russell Sage Foundation social survey symbols glued in place on a large map of the city.

Analysis indicated incoördination to be the key difficulty. Whether the 64 organizations and four coördinating groups are typical of the small American city is not within the scope of this study to determine. Certainly no element ordinarily encountered in community living seemed to be unrepresented in this town of 6,000 people.

SCHOOL ENVIRONMENT

The school environment was next made the subject of careful scrutiny, that it present no essential health hazard.

1. Physical Environment—A survey of the school plant was conducted by the physics classes of the high school. This study covered lighting, ventilation, temperature, sanitation, seating, and safety conditions. This responsibility was assumed in all seriousness by the pupils, and their findings and recommendations were made actual use of in the final plans for the health permitting school environment.

All conditions immediately detrimental were corrected at once, and improvements which did not entail great expenditure were made. Ventilation was improved by placing grilles in doors, windows, and walls; playground surfaces were improved; more attention was given to window shades, sanitation, toilets, redistribution of seating, etc.

A long-time program of major changes was next set up. This program has been carried on steadily until it is now virtually accomplished. First the citizens voted several thousand dollars for major changes. These included new toilet fixtures, new plumbing, and increased water supply in two buildings; new roofing for two buildings, new blackboards to conserve eyes, new shades for one building to improve lighting; new lighting fixtures in some rooms requiring considerable artificial light during the school day; new walks to increase safety; new walls in and about boiler rooms; changes in wall decorations to improve lighting and appearance; changes in the treatment of floors to improve sanitation, safety and appearance.

2. Social Environment — In the schools the interrelationship of mental, physical, and social health was already understood and its essential nature appreciated. Special consideration was given at P.T.A. meetings and conferences to encourage the home to assume its rightful responsibility for the health and social activity of its children.

A healthful social environment within the schools was promoted by the general teacher attitude and in the high school by the work of the special departments of vocational guidance, and physical education, working together with a trained personnel director. A course in social relationship was already being given as part of the social science curriculum in the high school.

In the beginning of the present program of threefold health, a survey of student opinion in the high school was made relative to personal social problems and the kinds and amounts of social activities desired. These opinions served as criteria for evaluating the social environment at school, and a guide for adjustments.

In the junior high school social activities in judicious amounts were introduced and special effort was made to secure participation by boys and girls who found difficulty in making social adjustments.

3. Curricular Environment—A survey of pupil load was made, in order to avoid either extreme, the overcrowded and overstimulating curriculum, or the unchallenging one. In the high school overloading appeared as the most serious among the conditions discovered. To obviate these curricular hazards, the programs were checked and a more personal guidance program instituted which included all classroom teachers as well as the two specially trained staff members.

The elementary school curriculum presented only one specific danger, fatigue. This danger is inherent in the plan of organization, a modified platoon, particularly when the work with special teachers begins with the first grade as was the case here until last year. It is the greater when teachers keep the children on their toes with interest as they do in Lewistown. The teachers consciously planned to counteract this recognized tendency not by making their teaching less interesting, but by definite and frequent relaxation periods.

THE SCHOOL HEALTH PROGRAM

The prerequisite of the actual essentials of healthful living at home and a safe school environment being planned for, the school health program presented the basic three-part organization: health service which puts the child in as nearly optimal condition as remains possible to him; health supervision, which keeps him so; and, *finally,* health instruction which renders him progressively self-supporting in health. While it is impossible to separate these three aspects of any school health program, the major responsibility rests as follows:

Service—physician assisted by nurse and to some extent by teachers
Supervision—nurse assisted by teachers
Instruction—teachers assisted by nurse and physician

I. HEALTH SERVICE

From the first, the goal of the full-time county unit was held steadily in mind by local and state personnel. The President of the School Board (who was also part-time city health officer) and the Superintendent of Schools had already been quietly promoting the county unit, and had worked out details of a plan for pooling the funds allotted to health by the county, city, and school district, and the fusion of personnel. This plan was adopted later on in the working out of this program to the advantage and satisfaction of all concerned. At the beginning of the program the city and county health departments were separate, each under a part-time health officer who took part time from his local practice. One "school nurse" was paid jointly by the City School District and the State Board of Health. She was doing traditional school nursing and was responsible directly to the Superintendent of Schools. As reorganized, the services of the county, city, and school district are fused and this county unit is directed by a full-time health officer.*

* Since the regrettable death of the Director of the County Unit, a suitable full-time health officer has not been found, and the service is temporarily in charge of a local physician with public health experience who, however, is unable to give more than half time from his private practice. Every effort is being made to secure a competent full-time man.

A second public health nurse was added and the service of the two generalized, one serving the city and the other the rest of the county. The field of the city sanitarian now includes the entire county and the county physician serves also the city, according to a coöperative plan with the County Medical Society.

The work of the Fergus County Health Unit is the same in scope as that of the other units described in the *Report of the Montana State Board of Health* for the last biennium. All serve the schools as elements of the community organization, the director of the county unit being in each case the director of the school health service. This paper is concerned with the way in which the school district of Lewistown has worked out its problems of orientation within an integrated community health program.

THE TEACHER'S HEALTH

The most unusual feature of this school health service is that it starts with the health of the teacher. After some experimenting the following plan was adopted and works to the satisfaction of teachers, administrators, and physicians.

Every teacher is given a complete physical examination once a year, by the physician of her choice at a fee ($5) determined by the local medical group and paid to the physician by the Board of Education from school funds. The completeness of the examination is insured by the use of the form prepared for teachers of the state by Director of the Maternal and Child Health Division of the State Board of Health. This form is filled out during the examination and given to the teacher, the only report going to the Superintendent's office being a slip saying that the physician considers the physical condition excellent, good, fair, or poor; that examination does or does not reveal conditions which render the teacher's occupation dangerous to those about him or her; whether modification of program is recommended in the teacher's own best interests; and whether further medical care is recommended. No one but the teacher himself or herself sees the specific findings of the examination.

The teacher's health is further safeguarded by sick leave on pay; a reasonable teaching load; a somewhat higher than average salary schedule, no distinction being made between elementary and high school pay or educational requirements; a state retirement fund; a real right of free speech; opportunity to grow in service giving a wholesome feeling of accomplishment and security.

THE PUPIL'S HEALTH

1. Periodical Physician's Examination—

The director of the county public health unit makes an annual routine examination of the pupils of the five grades—1, 4, 7, 9, and 12, and all entering pupils.

The presence of parents is insured by scheduling the parent and pupil for a definite hour, which the physician takes pains to meet. The nurse makes the appointment with the mother. Since the time is adapted to their convenience, a very high percentage of mothers are present.

Uniformity of examination and consistency of recording are furthered by use of the form on the cumulative health record, prepared and furnished free on request to the schools of the state by the State Board of Health. Since issuance a year ago, its use is spreading rapidly.

The teamwork of the nurse and teachers in the follow-up of the recommendations is described under health supervision. In cases where pupils are unable to pay for service recommended, the Board of Education may pay from

school funds when the county physician or a voluntary organization has not been able to take care of the child's need. A considerable number of bills for glasses, dentistry, tonsillectomies, and supplementary food have been met by the school district.

2. Immunization—

Every effort is being made to secure protection against diphtheria and smallpox in infancy. Those pupils not yet protected or who for some reason are not referred to a family physician are immunized on entrance as a part of the school health program.

3. Mantoux Tests for Tuberculosis—

These are given routinely to all first year students in grades and high school, and to all new students. X-rays are taken of all reactors. Follow-up of all cases and of contacts is a part of the health supervision exercised by the public health nurses.

4. Emergencies—

The director of the unit is on call for accidents or sudden illness serious enough to need immediate medical attention.

5. Dental Service—

Dental service is on the private office basis. Dental referral cards are sent to every home at the first of the school year urging the parents to take the child to the family dentist. A report back to the school is requested of the dentist, and cards are supplied. The referral cards with the form for reply are furnished free by the State Board of Health.

6. Nursing Service—

The bulk of the work of the nurse in behalf of the school child falls under supervision in our threefold division of the school health program.

Certain of her functions, however, fall logically under service:

Assists the doctor in the periodical examination at school

Assists in giving inoculations and vaccinations, and Mantoux tests

Holds routine interviews with all pupils referred by the teacher

Makes routine inspection of all pupils of the grades not examined by the doctor

Answers emergency calls in case of injuries and illnesses at school

Includes the school age child in all phases of her family service, giving sick care when necessary, thus being sure that in protecting the health of the school age child she is not overlooking health situations in the home which influence the child's health

Also includes maternity, infant, and preschool service in her generalized program so that every effort is made to insure optimal health for the children who enter school at the age of 6 years

7. Nutrition Service—

Conditions have changed radically and rapidly during the period covered by the program. In the beginning the need for food was still acute and the WPA facilities were made use of during the first two years. The education of the pupil and parent was meanwhile concentrated on by nurse and teacher and county extension agent. Finally the combination of education and improved economic conditions in the home seemed to indicate that the emergency phase of school feeding might be considered past, and only the two procedures considered an essential part of any permanent school health service were retained.

a. Mid-session milk for those who in the judgment of the nurse and teacher would profit by extra nourishment, or those whose parents request that they have it. The judgment is based on the knowledge of the total food intake of the child. Because of the intimate knowledge of the pupils shared by the nurse and teacher, this knowledge may be considered unusually reliable.

b. Noon lunch for pupils who live too far away to go home at noon. In the 6 elementary grades one hot milk drink or milk soup is provided to supplement the packed lunch. In high

school a balanced hot plate and drink are served at exact cost.

Last year all school feeding was discontinued, tentatively. This was for three reasons: (1) it was becoming increasingly difficult to obtain help; (2) the turnover of teachers became so acute that anything outside the classroom teaching procedures took on extraordinary difficulty; (3) the most cogent, it seemed possible that the new prosperity which places adequate food within the financial reach of practically all families afforded the strategic opportunity to return the responsibility of feeding their children to the home. The school participated in an educational program carried on by the County Nutrition Committee, the aim of which was to prepare the mothers more adequately to assume this responsibility. It was evident, however, that there does exist an educational aspect of school feeding and that mid-session milk and a hot drink or soup with the carried lunch constitute features of the irreducible minimum of any school health program. It is definitely planned to reinstate these as a permanent feature of the school experience.

Thus far the war has not made serious changes in the food intake of the children of this community. Plans are being formulated to take care of the inevitable shifting and shortages which have come a little more slowly to this ranching and dairying county than to some other regions.

II. HEALTH SUPERVISION

It is impossible to separate supervision from service on the one hand and instruction on the other. The nurse is therefore inextricably bound up with the work of those who serve the child in the two professional groups—health and education. She is the key person in any public health program.

In the Fergus County Health Unit, one of the two nurses is assigned to the City of Lewistown which has a population of about 6,000. Naturally there is not much time for individual supervision of the child at school. Through her maternal, infant, and preschool program, the school child is served most effectively before he becomes a school child. Supervision of the school children at school is carried on chiefly through the teachers who have them under observation in small groups every day. The collaboration of nurse and teacher is so effectively worked out that it constitutes the most distinctive feature to date of this school health program. The fact that the functional interpretation of education is really accepted by these teachers makes health instruction which fails of application a recognized absurdity. Thus, teacher and nurse are brought together from their specific fields in a complete fusion of effort. The joint function, for want of a better term, is referred to as health supervision.

The Personal Folder—In this school system individualization had been developed to such a degree that a personal folder follows each pupil from kindergarten to high school. In the year of the beginning of the present health program, the first folders started in kindergarten had reached first year high school. It was a vehicle providentially at hand for the addition of, or rounding out of, records of physical health.

These folders in the elementary schools are kept in the desks of the classroom teacher where they are in constant use. In the junior and senior high schools, they are filed in administrative offices, readily accessible. At present the data routinely included are:

a. Cumulative health records carrying personal information from the kindergarten through the high school. Upon this form the findings of the medical examinations are recorded and all notations by physician, dentist, nurse, teachers, and social workers are

transcribed in condensed form. Emotional health is included and sufficient information regarding school progress to give a picture of the child as a functional unit.

b. All records, scholastic, social, and physical, other than those contained in the cumulative health records.

c. Copies of teachers' letters to parents, parents' notes to the school, and notations regarding conferences with parents or others concerning the pupil.

d. The teacher's yearly informal summarizing reports of the child.

The Nurse-Teacher Work Sheets—The implementing instrument for utilizing this fund of information about the child is the nurse-teacher work sheet. This is a detailed form upon which are checked for each pupil the specific goals for health improvement toward which the effort of teacher and nurse are to be directed. It is doubtful if dissipation of effort can be prevented without the focus that a common work sheet gives. At the end of every school year the year's health history as recorded on the work sheet is summarized and entered on the cumulative record. At the beginning of his next school year, new ones are prepared for the continuation of combined effort toward specific improvements. It is only as a result of itemized efforts that the cumulative result of improved general health can be achieved and the child's total condition raised progressively nearer and nearer the optimal.

After the first year's use of the nurse-teacher work sheet a plan was worked out obviating the duplication for the teachers of this work-sheet and the personal record already routinely kept by the teachers. The plan has proved satisfactory to all concerned.

Routine of Collaboration—The effectiveness of health supervision in the schools depends primarily upon the division of labor between teacher and nurse. With increasing demand for nurses in defense, and the multiplicity of extracurricular demands upon the teacher, this becomes increasingly important. Each has her peculiar field within which her contribution is most effectively and most economically made.

It is agreed by all concerned that in the generalized service the school child is served most effectively as a member of the family unit. In conserving the time of the nurse it is most important to minimize the time spent on the school premises.

The Lewistown plan was worked out by the elementary supervisor and the present public health nurse. It omits entirely the routine visit of the nurse to the school.

Visits on behalf of school children are made on request of teacher or principal on a "request for nursing services" form. These forms are filled out every morning and placed on the principal's desk in each building. The elementary supervisor collects these every day in her rounds, and leaves them on the nurse's desk in her office. At the same time she takes up the slips left previously on which the nurse has written the report of the call including the requested information. This plan works simply and smoothly and, most unusual of all, promptly. Teachers for the most part have this report the next day. The nurse's time is conserved for her professional services.

Needless to say, the nurse is not concerned with attendance except where health problems are involved.

Emergency calls are telephoned direct to the nurse's office. These are becoming increasingly infrequent with teachers' growing ability to deal with situations and the elimination of safety hazards from the school plants.

Since the nursing service is generalized, every visit, however initiated, is a complete visit to the family as a whole.

Conferences at School—The time of the

nurse is conserved by the readiness of parents to come to the school to talk over all manner of problems. Many a home visit is obviated by a school conference with the mother, and many a visit is made unnecessary by the principal and teacher including health as a matter of course in their conversations with parents.

Last year the scheduled parent conference took the place of the monthly letters to the home. (The school system had long since discarded the report card with its formal grading.) Defense activities recently have interfered with this scheduling of conferences so that the informal letters are substituted when the personal conference is not practicable. Health takes its place in the unit picture of the child under consideration thus, incidentally, reducing still further demands on the nurse's time. The cumulative health record, and the nurse-teacher work sheet afford definite data for the teacher in these conferences.

The unscheduled parent conference, however, is more important, and indicates a rapport between the school and home which makes possible the general response to the regular conferences. It was this very unusual freedom of intercourse between school and home that gave first indication to the new Health Education Service that here was fertile soil for a proving ground. The Parent Teachers Association is a going concern and the freedom of discussion of common problems takes the place of much individual discussion.

Education of Teachers in Service—The proposal of this more active rôle of the teachers in personal health supervision brought a certain amount of uneasiness on their part as to whether they were qualified to form judgments in this field.

The local medical group was requested to give a series of talks to the teachers on the characteristics of health in childhood and the essentials of healthful living. One lecture was illustrated by children chosen to demonstrate prime condition. In addition to the reassurance these lectures gave the teacher, the giving of them fostered a spirit of sponsorship in the medical group.

Health literature was furnished each building for the teachers' use. Textbooks on the college level in personal and public health were bought, *Hygeia* was subscribed for, and lists of reference material for loan and for free distribution by the State Board of Health were supplied.

The most important assistance for the teachers came, as always, from the nurse. In her frequent and friendly contacts they found an ever present help, and feelings of insufficiency were short lived.

III. HEALTH INSTRUCTION

The more completely integrated a program is, the more difficult an organized presentation. The work of the classroom teacher in health supervision merges so completely with the application phases of health instruction that much of the discussion would be appropriate under either head. Particularly is this true here where all instruction is on the unit activity basis, that is, is functional in aim.

Health is taught here as a basic scientific body of subject matter with the aim of developing a recognition of and respect for cause and effect which will result in present application of the facts taught and in successful adaptation to changing conditions.

Present space precludes discussion of teaching procedures.

The most critical year of the program described above lies just ahead. The school year 1944–1945 opens after two years of war have made inevitable inroads upon the program described above, but since the planning had been

from the first in lowest terms, with the participation of the whole citizenry provided for, the war emergency has been less destructive in its effects than might have been feared. There has been compensatory increase of effort in some directions which partially offset the depletion of human resources in others.

Most serious of all is the diminished medical service and the consequent overwork of the nurses, sanitarian, and all who in any way can carry a fragment of the physicians' load. The examinations of school children have been discontinued. The annual examination of teachers is carried on as usual, but more hurried in some cases, as the pressure on the doctors increases. The incidence of communicable disease has increased as it has throughout the state.

The increased responsibility assumed by the home and the teachers, however, has gone far toward compensating for the lessened professional service. While there are no numerical data, the consensus is that noncommunicable illness has decreased.

The children are reported as being definitely better fed, and the mothers more appreciative of the help of the home demonstration agent, the social worker, and the visiting nurse. The teachers are taking over more of their rightful rôle in guidance, and the time of the public health nurses is thereby still further conserved.

The encouraging feature of the situation is that the responsibilities being assumed by the school and home are coming to be recognized as their rightful prerogatives and not to be relinquished when the technical health services are restored. With the post-war return to pre-war staffing, a greatly increased effectiveness is to be expected.



Typhoid Vaccine Studies IX

Intracutaneous versus Subcutaneous Vaccination for Initial Immunization

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IN 1939, Siler and Dunham [1] published a preliminary report on the re-immunizing effect of 0.1 ml. of vaccine intracutaneously administered. During the following year, Longfellow and Luippold [2] reported results on an extension of the preceding work.

Since this time, it has been asked why the intracutaneous route for the establishment of *initial* immunity has not been adopted, inasmuch as it had been recommended for revaccination. The answer, of course, is that, although there is a mass of clinical and experimental data on the effectiveness of subcutaneous vaccination, there are no comparable data on the efficacy of vaccination by the intracutaneous method. Realizing the capacity of the skin to produce antibodies, an investigation of dosage and routes of administration of typhoid vaccine was begun here early in 1940, but this study was interrupted by the intervention of other and more urgent work, and was postponed until time and material again became available.

Meanwhile, we had made an observation on a diminutive-scale comparison of these two methods of vaccination. During the latter part of 1942, we received specimens of serum from Morgan [3] as control material on other sera included in an investigation being conducted by him at that time. Eight of the control sera were from persons who had been inoculated intracutaneously with 0.05, 0.1, and 0.1 ml. of commercial T.A.B. vaccine, while 7 were from individuals who had received 0.5, 1.0, and 1.0 ml. of the same vaccine subcutaneously. The sera of these 15 persons were titrated for protective substances [4] active against *Eberthella typhosa*. Results of these titrations have been recorded in Table 1.

TABLE 1

Results of Serum Protection Tests on Small Groups of Individuals Vaccinated, Respectively, With an Intracutaneous Course of T.A.B. Vaccine Consisting of 0.05, 0.1 and 0.1 ml., and with a Subcutaneous Course of 0.5, 1.0, and 1.0 ml.

Minimal Lethal Doses of Test Organism (E typhosa)	Number and Per cent of Persons Whose Sera, in 0.1 ml. Amounts, Protected Groups of 4 Mice Against the Doses of Test Organisms Listed in Column on left			
	Intracutaneous Group		Subcutaneous Group	
	No. of Persons	Per cent	No. of Persons	Per cent
100,000	..		2	28.5
10,000	..		3	43.0
1,000	2	25.0	..	
100	4	50.0	2	28.5
10	2	25.0	..	
Totals	8	100.0	7	100.0

If these results were any indication of what would happen in large groups of individuals, it was plain that intracutaneous vaccination is definitely inferior to the subcutaneous method—*in the dosages used.* Morgan and his

associates [3] commented on this observation as follows: "The intradermal administration of bacterial vaccines was found less effective than the subcutaneous route." As will be shown later, dosage is an important factor; and to have added "in the dosages used" would have been a desirable qualification.

Meanwhile, also, we were aware of an increasing tendency toward intracutaneous administration of typhoid vaccine by many agencies, for the establishment of initial immunity. The most interesting report of this activity appeared under the heading of "Vaccination: Wholesale," in which Fennel [5] wrote of the widespread practice of intracutaneous vaccination of the civilian population of Hawaii by the local health authorities. This incident in Hawaii has also been revealed in the introduction to a paper by Tilden and Arnold.[15] The popularity of the intradermal method of antityphoid vaccination in Cuba has been commented upon by Curbelo,[17] and more fully expounded in a paper by Argudin.[16]

We were also aware of the many reported studies on the comparative effectiveness of intracutaneous and subcutaneous vaccination; but all of these, with the single exception noted below, were evaluated on the basis of agglutinative titers, whereas we desired an evaluation based upon the production of demonstrable protective substances in the blood serum.

Tuft [6] (1931) advocated as a routine procedure the intracutaneous administration of 4 doses of triple typhoid vaccine (0.05, 0.1, 0.15, and 0.2 ml.) spaced by an interval of from 5 to 7 days. At this time, his conclusions were based on the results of agglutinin titrations; but in 1940, Tuft [7] reported the results of mouse protection tests with pooled sera from 9 individuals who had been vaccinated intracutaneously with 3 doses of typhoid vaccine (0.1, 0.15, and 0.2 ml.) at weekly intervals. The protective titer of this pooled serum was reported to be somewhat higher than that of a pooled sample of serum from 19 subjects who had received 0.5, 1.0, and 1.0 ml. of the vaccine subcutaneously. Tuft then recommended the 3 intracutaneous injections cited above as routine procedure.

Valentine, Park, Falk, and McGuire [8] (1935) reported on the agglutinin response produced by intracutaneous and subcutaneous vaccination, concluding that the intracutaneous doses employed were as effective as five times the amount of vaccine subcutaneously administered, but that one-tenth of the subcutaneous dose intracutaneously administered "produced slightly less response."

Perry [9] (1937) employed a course of T.A.B. vaccine consisting of 3 intracutaneous doses (0.05, 0.1, and 0.1 ml.) administered at weekly intervals; and, for the control group, subcutaneous doses of 0.5, 0.8, and 1.0 ml. He stated that these procedures were equally effective in the production of "H" and "O" agglutinins.

Wyandt, Bayliss, Tollman, and Gunderson [10] (1938) used intracutaneous doses of 0.05, 0.1, and 0.1 ml., and subcutaneous doses of 0.5, 1.0, and 1.0 ml. of T.A.B. vaccine. In both courses of vaccination, the doses were spaced by 1 week. These workers reported that the subcutaneous course produced approximately twice the antibody [agglutinin] response of that produced by the intracutaneous doses.

Van Gelder and Fisher [11] (1941) reported on a large group of children in whom they found an equal degree of response to "H" antigens by the intracutaneous and subcutaneous methods, but the latter produced a higher average "O" titer. Despite the inferior production of "O" agglutinins produced by the intracutaneous doses of 0.05, 0.1, and 0.15 ml., these workers recom-

mended this course for subjects weighing 120 lb. or more, in preference to the usual dosage administered subcutaneously.

Naumer and Nerb [12] (1943) vaccinated respective groups of children intracutaneously (0.1, 0.2, 0.3, and 0.4 ml.) and subcutaneously (0.5, 0.75, and 1.0 ml.). They reported that "The intracutaneous injections were followed by a slightly higher ["H" and "O"] titer formation although the difference is hardly significant."

Leibovitz [13] (1943) reported that higher "H" and "O" titers were produced in girls vaccinated intracutaneously with 0.05, 0.1, and 0.1 ml. of T.A.B. vaccine, than in boys vaccinated subcutaneously with ten times this dosage; and that "O" agglutinins disappeared more rapidly from the blood serum of the subcutaneously vaccinated boys during a period of 13 months, implying that intracutaneous vaccination favored persistence of "O" agglutinins.

Kamp [14] (1943) vaccinated a total of 946 children with an intradermal course of 0.1, 0.15, and 0.2 ml. of T.A.B. vaccine, and concluded, on the basis of previous work and on his own findings of economy and marked absence of general reactions, and a minimum of discomfort associated with the local reactions, that "Sufficient work has been done to warrant using this method as a means of initial typhoid fever immunization."

Thus, it will be seen that the production of agglutinins has been quite generally accepted as an index to the production of protective substances, or as a criterion for appraising the relative effectiveness of intracutaneous and subcutaneous vaccination. This paper reports a direct determination of protective antibodies, as demonstrated by mouse protection tests, produced by each of the two methods of immunization under discussion; and a comparative evaluation of these methods on the basis of demonstrable protective substances in the blood serum. Typhoid "H" and "O" agglutinative titers have also been determined as a matter of interest only.

THE PRESENT INVESTIGATION

Subjects—These were medical students, first and second year, recruited from six major universities. Only those students whose histories were negative for typhoid fever and for antityphoid vaccination were included in this study.

The Vaccine—Triple typhoid (T.A.B.) vaccine [18] prepared in the Division of Biologic Products of the Army Medical School was used exclusively.

Dosages of Vaccine—A review of the literature, and of unpublished work brought to the author's attention by advocates of the intradermal method, indicate that three courses of vaccine have chiefly been used and recommended for intracutaneous vaccination: (a) 0.05, 0.1, and 0.1 ml., (b) 0.1, 0.15, and 0.2 ml., and (c) 0.1, 0.2, and 0.2 ml. It appears that 0.2 ml. represents the maximum amount of material that can be injected intracutaneously without producing undue physical destruction of tissue, or leakage into subcutaneous tissues. To those individuals in the control groups, the standard course (0.5, 1.0, and 1.0 ml.) of vaccine was administered subcutaneously. The interval between doses was, in all instances, 7 days.

Collection of Serum—All subjects were bled from 1 to 7 days prior to the administration of the first dose of vaccine, and again 14 days following the last dose. The serum was separated aseptically, and stored in the refrigerator without the addition of a preservative.

Instructions to Group Leaders at Medical Schools—In order to standardize the procedures as nearly as practicable at the six medical schools participating in this investigation, the following instructions (altered slightly)

TABLE 2

Comparison of Typhoid Protective Titers Produced by 0.05, 0.1, and 0.1 ml. of T.A.B. Vaccine Intracutaneously Administered, With Those Titers Produced in the Control Subjects by the Standard Subcutaneous Course of 0.5, 1.0, and 1.0 ml.

Number and Per cent of Persons Whose Sera, Before and After Vaccination, Protected Mice Against the Doses of Test Organism Listed in Column on Left

Minimal Lethal Doses of Test Organism	Before Vaccination				After Vaccination			
	Intracutaneous Group		Subcutaneous Group		Intracutaneous Group		Subcutaneous Group	
	No. of Persons	Per cent	No. of Persons	Per cent	No. of Persons	Per cent	No. of Persons	Per cent
10,000	..	..	..	..	3	15	9	45
1,000	..	..	..	..	11	55	10	50
100	..	..	1	5	6	30	..	..
10	2	10	..	..	..	..	1	5
1	6	30	5	25	..	..	..	..
Failed against 1	12	60	14	70	..	..	..	..
Totals	20	100	20	100	20	100	20	100

TABLE 3

Comparison of Typhoid Protective Titers Produced by 0.1, 0.15 (or 0.2), and 0.2 ml. of T.A.B. Vaccine Intracutaneously Administered, With Those Titers Produced in the Control Subjects by the Standard Subcutaneous Course of 0.5, 1.0 and 1.0 ml.

Number and Per cent of Persons Whose Sera, Before and After Vaccination, Protected Mice Against the Doses of Test Organism Listed in Column on Left

Minimal Lethal Doses of Test Organism	Before Vaccination *				After Vaccination			
	Intracutaneous Group		Subcutaneous Group		Intracutaneous Group		Subcutaneous Group	
	No. of Persons	Per cent	No. of Persons	Per cent	No. of Persons	Per cent	No. of Persons	Per cent
100,000	..		..		..		6	6.0
10,000	..		..		21	21.0	33	33.3
1,000	..		..		35	35.0	31	31.3
100	1	1.0	..		29	29.0	21	21.2
10	5	5.3	5	5.3	11	11.0	3	3.0
1	17	17.8	16	16.7	4	4.0	5	5.0
Failed against 1	72	75.8	74	77.8	..		..	
Totals	95	99.9	95	99.8	100	100.0	99	99.8

* 9 specimens lost in transit

TABLE 4

SUMMARY: *Comparison of Typhoid Protective Titers Produced in All Persons Intracutaneously Vaccinated in This Study With Those Titers Produced in Control Subjects Receiving the Standard Subcutaneous Course of Vaccine*

Number and Per cent of Persons Whose Sera, Before and After Vaccination, Protected Mice Against the Doses of Test Organism Listed in Column on Left

Minimal Lethal Doses of Test Organism	Before Vaccination *				After Vaccination			
	Intracutaneous Group		Subcutaneous Group		Intracutaneous Group		Subcutaneous Group	
	No. of Persons	Per cent	No. of Persons	Per cent	No. of Persons	Per cent	No. of Persons	Per cent
100,000	..		..		..		6	5.0
10,000	..		..		24	20.0	42	35.3
1,000	..		..		46	38.3	41	34.4
100	1	0.9	1	0.9	35	29.2	21	17.7
10	7	6.0	5	4.3	11	9.1	4	3.3
1	23	20.0	21	18.2	4	3.3	5	4.2
Failed against 1	84	73.0	88	76.5	..		..	
Totals	115	99.9	115	99.9	120	99.9	119	99.9

* 9 specimens lost in transit

were circularized among the group leaders:

"This comparison of the immunogenic effectiveness of intracutaneous and subcutaneous administration of triple typhoid vaccine will be based on the results of serum protection tests. However, both 'H' and 'O' agglutinative titers of the sera will also be determined. It is requested that the following outlined procedures be adhered to as closely as practicable in order that this and similarly treated groups may be considered jointly as one large group.

"1. Only primary cases should be chosen. Histories of previous antityphoid immunization and of typhoid and paratyphoid fevers should be negative. . . .

"2. Groups (classes) should be divided, as nearly as possible, into two subgroups of equal numbers—one to receive vaccine intracutaneously, the other to be vaccinated subcutaneously.

"3. Triple typhoid vaccine, prepared at the Army Medical School, will be used. This is the stock 'Army T.A.B.' product, and will be supplied in adequate amounts.

"4. Recommended Dosage: Intracutaneously, one of the following: (a) 0.05 cc., 0.1 cc., and 0.1 cc., (b) 0.1 cc., 0.15 cc., and 0.2 cc., (c) 0.1 cc., 0.2 cc., and 0.2 cc. Subcutaneously, 0.5 cc., 1.0 cc., and 1.0 cc. In each instance, the interval between doses should be one week.

"4. a. Site of Injection: (Separate communication. The area described as the inser-

TABLE 5

Comparison of Paratyphoid A Protective Titers Produced by 0.05, 0.1, and 0.1 ml. (in 20 Persons) or More (in 45 persons) of T.A.B. Vaccine Intracutaneously Administered With Those Titers Produced in the Control Subjects by the Standard Subcutaneous Course of Vaccine

	Number and Per cent of Persons Whose Sera, Before and After Vaccination, Protected Mice Against the Doses of Test Organism Listed in Column on Left							
	Before Vaccination				*After Vaccination*			
	Intracutaneous Group		*Subcutaneous Group*		*Intracutaneous Group*		*Subcutaneous Group*	
Minimal Lethal Doses of Test Organism	*No. of Persons*	*Per cent*	*No. of Persons*	*Per cent*	*No. of Persons*	*Per cent*	*No. of Persons*	*Per cent*
1,000	..		..		..		1	1.5
100	..		..		4	6.1	18	27.7
10	2	3.0	1	1.5	32	49.2	30	46.2
1	6	9.2	10	15.4	22	33.8	14	21.5
Failed against 1	57	87.7	54	83.0	7	10.8	2	3.0
Totals	65	99.9	65	99.9	65	99.9	65	99.9

TABLE 6

Comparison of Paratyphoid B Protective Titers Produced by 0.05, 0.1, and 0.1 ml. (in 20 Persons) or More (in 50 Persons) of T.A.B. Vaccine Intracutaneously Administered, With Those Titers Produced in the Control Subjects by the Standard Subcutaneous Course of Vaccine

	Number and Per cent of Persons Whose Sera, Before and After Vaccination, Protected Mice Against the Doses of Test Organism Listed in Column on Left							
	Before Vaccination				*After Vaccination*			
	Intracutaneous Group		*Subcutaneous Group*		*Intracutaneous Group*		*Subcutaneous Group*	
Minimal Lethal Doses of Test Organism	*No. of Persons*	*Per cent*	*No. of Persons*	*Per cent*	*No. of Persons*	*Per cent*	*No. of Persons*	*Per cent*
100,000	..		..		14	20.0	31	44.3
10,000	..		..		34	48.6	22	31.4
1,000	3	4.3	1	1.4	20	28.5	15	21.4
100	15	21.4	11	15.7	2	2.8	2	2.8
10	14	20.0	16	22.9	..		..	
1	12	17.1	13	18.5	..		..	
Failed against 1	26	37.1	29	41.4	..		..	
Totals	70	99.9	70	99.9	70	99.9	70	99.9

TABLE 7

Comparison of Typhoid "H" and "O" Agglutinin Titers Produced in 20 Subjects by a Course of 0.05, 0.1, and 0.1 ml. of T.A.B. Vaccine Intracutaneously Administered, With Those Titers Produced in 20 Control Subjects by the Standard Subcutaneous Course of Vaccine

Method of Vaccination	Type of Agglutinin	Numbers of Individuals Whose Sera, After Vaccination, Agglutinated the Respective Antigens Completely in the Dilutions Set Forth Below									
		1:20	1:40	1:80	1:160	1.320	1.640	1:1,280	1:2,560	1:5,120	Average
Intracut.	"H"	..	1	..	4	3	4	2	6	..	1:1,106
Subcut.	"H"	..	..	1	..	3	4	5	4	3	1:1,780
Intracut.	"O"	2	3	9	5	1	..	..	..	..	1:100
Subcut.	"O"	..	2	7	5	3	2	1	..	..	1:248

TABLE 8

Comparison of Typhoid "H" and "O" Agglutinin Titers Produced in 95 Subjects by a Course of 0.1, 0.15 (or 0.2), and 0.2 ml. of T.A.B. Vaccine Intracutaneously Administered, With Those Titers Produced in 95 Control Subjects by the Standard Subcutaneous Course of Vaccine

Method of Vaccination	Type of Agglutinin	Numbers of Individuals Whose Sera, After Vaccination, Agglutinated the Respective Antigens Completely in the Dilutions Set Forth Below									
		1:20	1:40	1:80	1:160	1:320	1.640	1:1,280	1:2,560	1:5,120	Average
Intracut.	"H"	..	..	6	11	18	22	22	12	4	1:1,068
Subcut.	"H"	..	..	3	13	11	25	21	16	6	1:1,267
Intracut.	"O"	13	10	32	32	6	2	..	..	..	1:122
Subcut.	"O"	3	17	26	30	14	5	..	..	..	1:161

TABLE 9

SUMMARY: *Comparison of Typhoid "H" and "O" Agglutinin Titers Produced in All Persons Intracutaneously Vaccinated in This Study, With Those Titers of the Subcutaneously Vaccinated Control Subjects*

Method of Vaccination	Type of Agglutinin	Numbers of Individuals Whose Sera, After Vaccination, Agglutinated the Respective Antigens Completely in the Dilutions Set Forth Below									
		1:20	1.40	1:80	1:160	1:320	1:640	1:1,280	1:2,560	1:5,120	Average
Intracut.	"H"	..	1	6	15	21	26	24	18	4	1:1,074
Subcut.	"H"	..	..	4	13	14	29	26	20	9	1:1,356
Intracut.	"O"	15	13	41	37	7	2	..	..	..	1:118
Subcut.	"O"	3	19	33	35	17	7	1	..	..	1:176

tion of deltoid muscle was chosen by all group leaders for both methods of administration.)

* * *

"6. Specimens of Serum: A 30 cc. specimen of blood should be drawn from each person just prior to the administration of the first dose of vaccine, and again on the 14th day following the last dose. The serum should be aseptically separated and bottled (or tubed), and plainly labeled with the person's name and the date on which the specimen was collected . . ."

PROTECTIVE TITERS

Serum protection tests[4] were performed on all sera to determine the extent of production of typhoid protective substances, but protective titers for *Salmonella paratyphi* and *Salmonella schottmuelleri* were determined on only a limited number of sera. Typhoid protective titers have been recorded in Tables 2 and 3, and summarized in Table 4. Since the disparity between the two intracutaneous courses consisting of the larger doses is not significant (0.05 ml.), the titers of individuals receiving these courses have been combined in Table 3. Para A and B protective titers have been recorded in Tables 5 and 6 respectively.

AGGLUTINATIVE TITERS

Typhoid "H" and "O" agglutinative titers were determined by the familiar test-tube titration method with standard "H" (formalinized H–901)

and "O" (alcohol-treated O–901) antigens. These titers have been recorded in Tables 7, 8, and 9.

DURATION OF PROTECTIVE AND AGGLUTINATIVE ANTIBODIES

Leibovitz [13] reported a more substantial duration of agglutinins in intracutaneously inoculated children than in their subcutaneously vaccinated controls. In view of this finding, it was thought desirable to study this factor of duration in respect to protective substances before concluding our investigation. Sera from the participants of the original vaccination experiment who were still available and eligible * for follow-up tests were obtained through the coöperation of group leaders at three of the participating medical schools. However, a total of only 18 sera representative of each vaccinated group were received. These were titrated for agglutinative and protective antibodies for whatever information they would provide. Results of these titrations have been recorded in Tables 10 and 11.

REACTIONS

Data on reactions were collected by a method somewhat different from any that has hitherto been used. At the time of administering the first dose of vaccine, each student was given a blank form (illustrated below) on which he was requested to record his reactions. Instructions to group leaders who supervised the procedures at their respective schools read as follows:

"Reactions: These should be recorded by the individuals themselves, in their own words and with a minimum of coaching or warning of manifestations to be anticipated. The attached form, copies of which will be supplied, is suggested for the use of each individual."

* Some of the participants had been inducted into the Army or Navy and revaccinated before the expiration of one year.

TABLE 10

Comparison of Typhoid Protective Titers Persisting One Year After Vaccination in 18 Persons Who Received an Intracutaneous Course of 0.05, 0.1, and 0.1 ml. (or More) of T.A.B. Vaccine, and in 18 Persons Who Received the Standard Subcutaneous Course

Minimal Lethal Doses of Test Organism	Number and Per cent of Persons Whose Sera, One Year After Vaccination, Protected Mice Against the Doses of Test Organism Listed in Column on Left			
	Intracutaneous Group		Subcutaneous Group	
	No. of Persons	Per cent	No. of Persons	Per cent
10,000	..		3	16.6
1,000	5	27.7	6	33.3
100	3	16.6	3	16.6
10	6	33.3	3	16.6
1	4	22.2	3	16.6
Totals	18	99.8	18	99.7

TABLE 11

Comparison of Typhoid "H" and "O" Agglutinin Titers Persisting One Year After Vaccination in 18 Persons Who Received an Intracutaneous Course of 0.05, 0.1, and 0.1 ml. (or More) of T.A.B. Vaccine, With Those Titers Produced in 18 Persons Vaccinated With a Standard Subcutaneous Course

Method of Vaccination	Type of Agglutinin	Numbers of Individuals Whose Sera, One Year After Vaccination, Agglutinated the Respective Antigens Completely in the Dilutions Set Forth Below							
		1:10	1:20	1:40	1:80	1:160	1:320	1:640	Average
Intracut.	"H"	1	1	5	4	6	1	..	1:102
Subcut.	"H"	..	..	2	7	8	1	..	1:124
Intracut.	"O"	7	2	4	4	1	..	..	1:42
Subcut.	"O"	3	3	3	7	2	..	..	1:61

Data on Reactions Following Vaccination With T.A.B. Vaccine

NAME: _____ GRADE CLASS _____ ORG. SCHOOL _____

HISTORY OF TYPHOID OR PARATYPHOID FEVER: _____

PREVIOUS ANTITYPHOID VACCINATION: Number of Courses: _____

Date of last course: _____

METHOD OF ADMINISTRATION, THIS COURSE: (Check one) Intracutaneous
Subcutaneous

Dose	TIME OF READING	AREA OF HYPEREMIA		LYMPHATIC INVOLVEMENT	SYSTEMIC MANIFESTATIONS
		Size (in sq. cm.)	Degree of Tenderness		
1st	24 hrs.				
	48 hrs.				
2nd	24 hrs.				
	48 hrs.				
3rd	24 hrs.				
	48 hrs.				

This method is admittedly not without its faults, but it does possess certain advantages: Although it stimulates an anticipation of some ensuing reaction, there is an absence of suggestion of specific manifestations; a convenient form is available for recording the reactions at or soon after the time they occur, so that there are no blanks nor vagaries due to lapse of memory; and the records are made in a uniform manner, thus facilitating tabulation of data.

TABLE 12

Summary of Local and Systemic Reactions Following Subcutaneous Injections of the Standard Dosage (0.5, 1.0, and 1.0 ml.) and Intracutaneous Injections of One-tenth to One-fifth of this Dosage (115 Persons in Each Group)

Method of Vaccination	*Dose of Vaccine*	*Local*					*Lymphatic Involvement*			*Systemic*								
		Average Area of Hyperemia (Cm²)	*Degree of Tenderness*															
			None	*Slight*	*Moderate*	*Severe*	*None*	*Cervical*	*Axillary*	*None*	*Headache*	*Chills*	*Fever*	*Lassitude*	*Muscular Pains*	*Malaise*	*Nausea*	*Urticaria*
Intracut.	1st	19	6	69	33	7	70	2	44	94	6	1	2	5	0	7	2	0
Subcut.	1st	51	0	35	51	29	56	3	57	67	22	6	11	17	8	10	1	0
Intracut.	2nd	24	2	58	41	14	67	1	46	92	7	1	4	6	0	7	3	2
Subcut.	2nd	65	0	30	46	39	58	1	56	67	15	4	12	16	12	15	1	1
Intracut.	3rd	23	12	72	26	5	90	0	25	101	7	0	1	4	1	4	1	0
Subcut.	3rd	45	5	76	24	10	80	0	35	99	7	2	3	5	4	4	0	0
Total intracut.			20	199	100	26	227	3	115	287	20	2	7	15	1	18	6	2
Total subcut.			5	141	121	78	194	4	148	233	44	12	26	38	24	29	2	1

It is believed that these students were sufficiently advanced and trained to observe intelligently and record accurately the simple manifestations likely to be evoked by T.A.B. vaccination.

A summary of the individual reports received from the students has been entered in Table 12. There was one minor alteration: remarks such as "drowsiness," "felt tired," "muscular weakness," "not hungry," "faint feeling," "sluggishness," and others having similar implications, were grouped under the general heading of *lassitude*. When entries under the 24 hour and 48 hour periods differed, that entry indicating the more severe reaction was chosen for inclusion in the tabulated data.

DISCUSSION

Protective Titers—It appears that the intracutaneous course of 0.05, 0.1, and 0.1 ml. of T.A.B. vaccine is not as effective in the production of typhoid, paratyphoid A, and paratyphoid B protective substances as is the course consisting of 0.1, 0.2, and 0.2 ml.; also, that the latter is, in general, not as effective in respect to protective titers as is the standard subcutaneous course of 0.5, 1.0, and 1.0 ml. of vaccine. It is true that the differences in the latter comparison do not loom up as widely separated values, but it is believed that they are significant in view of the constant tendency in each of the six groups to favor the standard subcutaneous course.

Agglutinative Titers—As stated earlier in this paper, typhoid agglutinative titers were included only as a matter of interest. The "H" and "O" titers produced by the standard subcutaneous vaccination were, in general, higher than were those produced by any of the intracutaneous courses.

Duration of Protective and Agglutinative Antibodies—Unfortunately, we are dealing with too insignificant numbers of subjects to arrive at any definite conclusions. Leibovitz [13] vaccinated 41 girls (average age 10) intracutaneously with 0.05, 0.1, and 0.1 ml. of Lederle's T.A.B. vaccine, and 44 boys (average age 10) with a subcutaneous course of 0.5, 1.0, and 1.0 ml. of the same vaccine. He reported that the greater percentage of subjects with the higher "O" agglutinative titers were in the group vaccinated intradermally, on determinations made 13 months after vaccination, using the rapid slide agglutination technic of Welch and Stuart.[19]

We, on the other hand, vaccinated 18 young adult males intracutaneously with a course of 0.05, 0.1, and 0.1 ml. (or more) of Army T.A.B. vaccine, and a comparable group of persons subcutaneously with 0.5, 1.0, and 1.0 ml. of the same vaccine. At the end of 1 year, we found that both agglutinative and protective titers were higher, on an average, in the subcutaneously vaccinated individuals. Our agglutinative titers were determined by means of the commonly used tube titration method.

In summation, there was no suggestion in our results that these antibodies persisted longer in the blood serum of intracutaneously vaccinated persons than they did in persons vaccinated subcutaneously. Considering the fact that the titers for both types of antibodies were initially (14 days) higher in those individuals comprising the subcutaneous group, there was neither any evidence that persistence of antibodies is a special attribute of the subcutaneous administration of T.A.B. vaccine.

Reactions—A casual inspection of Table 12 reveals that, in general, both local and systemic reactions were appreciably less frequent and severe following intracutaneous injections of vaccine. This is in agreement with all reported studies cited elsewhere in this paper.

However, it was interesting to observe disparities between reactions among some of these vaccinated groups. At one school, for example, lymphadenitis

was much more frequent and pronounced among intracutaneously vaccinated individuals than among their subcutaneously vaccinated controls. At a different school, another irregularity noted was the almost indistinguishable rate of frequency and degree of severity of systemic reactions among intracutaneously and subcutaneously vaccinated persons. In fact, the third dose was not given to two persons in the intracutaneous group because of the severity of reactions, described as (1) "Very ill, chills, fever 104°," and (2) "Severe rash (Hives) with confluent wheals." At this same school, the third dose was also omitted in the case of one person in the subcutaneous group because of "Hives over entire body, swollen face, temp. 102°." In each instance, these reactions were reported to have occurred within 24 hours following the administration of the second dose of vaccine. The group leader at this school, in commenting upon reactions, remarked that he was "rather surprised at the slight difference between the groups." In general, however, there is little doubt of the relatively fewer and milder reactions evoked by the intracutaneous injections of the small doses of T.A.B. vaccine employed in this investigation.

Although we have not had an opportunity to observe late granulomatous reactions following intracutaneous injection of vaccine in individuals comprising this study, we have noted chronic granulomas in other intracutaneously inoculated persons. Tilden and Arnold[15] have reported their observations of this late reaction in the Hawaiian population reported by Fennel[5] to have been vaccinated chiefly by the intradermal method.

In the full awareness of the occurrence of occasional undesirable symptoms attributable to the subcutaneous dosage of T.A.B. vaccine, it is thought that too much weight has probably been given to reactions as a criterion for appraising methods of vaccination. While it is unquestionably desirable that reactions be reduced in frequency and severity (if this reduction can be accomplished without a reduction of immunological response), we do not agree with Van Gelder and Fisher[11] who stated: "It is this difference in reactions that renders the intradermal method superior to the subcutaneous method for typhoid immunization." After all, these are *immunizing* procedures; and, since neither is dangerous to life or injurious to health, superiority of one method over another must be based upon the degree of *immunological response*, not on the degree of freedom from annoyance.

Other Observations—The value of a combination of six group studies conducted according to a uniform set of stipulations, rather than the study of a single group, was made apparent in many ways. As an example, assuming that only the one school cited above (whose intracutaneously and subcutaneously vaccinated groups manifested almost the same rates and degrees of systemic reactions) had been observed, the relative innocuousness of intradermal injection of T.A.B. vaccine, quite evident in the other five schools, would not have been confirmed. In another instance, the protective titers produced by the two methods of administering vaccine, although slightly in favor of the subcutaneous method, were not significantly so as they were in the other five comparative groups. In still another instance, typhoid "H" and "O" titers were so nearly equal that, from this single comparison one would be forced to conclude that the two routes and the dosages employed were equally productive of agglutinin titers. In short, if it were not for the five other comparative groups acting as a counterbalance on some one observation made of a single group, it is easy to discern at least three conclusions that

would be divergent from those that have been set forth below.

CONCLUSIONS

1. The standard subcutaneous course of T.A.B. vaccine consisting of 0.5, 1.0, and 1.0 ml., is more effective in the production of typhoid, paratyphoid A, and paratyphoid B protective substances than is one-tenth to one-fifth of this dosage intracutaneously administered.

2. The standard subcutaneous course of T.A.B. vaccine is more effective in the production of typhoid "H" and "O" agglutinins than is one-tenth to one-fifth of this dosage intracutaneously administered.

3. In small experimental groups, there was found no evidence that persistence of agglutinative or protective antibodies, at the end of 1 year, is a special attribute of either intracutaneous or subcutaneous administration of T.A.B. vaccine.

4. Although local and systemic reactions are more frequent and pronounced following administration of the standard subcutaneous doses of T.A.B. vaccine than following the intracutaneous injection of one-tenth or one-fifth of these doses, it is not felt that we can risk any lowering of protection for the questionable reward of milder reactions. Under the best of conditions of immunological response to artificial immunization, we cannot expect our standard method of vaccination to be adequate at all times in the field to the challenge of infecting organisms. Adoption of the intracutaneous administration of reduced doses of T.A.B. vaccine would seem to increase this inadequacy.

5. It is not to be inferred from these conclusions that the intracutaneous administration of T.A.B. vaccine for the establishment of initial immunity is indiscriminately condemned. On the contrary, intracutaneous vaccination has a definite usefulness in its application to elderly persons and to allergic individuals, in whom severe or serious disturbances may be avoided by the administration of reduced doses, intradermally placed.

6. It is neither to be inferred that we consider the standard subcutaneous course of T.A.B. vaccination as the ultimate in antityphoid vaccination procedures. Intervals between doses, and the doses themselves, would bear investigation. Preliminary studies on these questions are now in progress.

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ACKNOWLEDGMENTS: The author gratefully acknowledges the help and coöperation of a number of contributors who have, by bleeding and vaccinating their groups of subjects, provided the bulk of material required for this study. Among these contributors are Dr. John F. Kessel of the University of Southern California, Drs. Stuart Mudd and

Harry E. Morton of the University of Pennsylvania, Dr. Theodor Rosebury of Columbia University, Dr. Earle H. Spaulding of Temple University, and Dr. Donald S. Martin of Duke University. Our thanks are also due Dr. Leland W. Parr of George Washington University for securing the coöperation of his medical students. And to the many volunteers whose blood serum made this study possible, we wish to express our sincere appreciation.

Institute on Rural Youth Migration

The Annual Meeting of the Institute on War and Postwar Problems of Rural Youth Migration was recently held in Washington, D. C., including a section on Rural Health Conditions under the Chairmanship of C. L. Williams, Jr., M.D., of the States Relations Division, U. S. Public Health Service. Other members of the section interested in public health included Anna Heisler, R.N., U. S. Public Health Service, Fred Mott, M.D., U. S. Public Health Service and Chief Medical Officer of the Farm Security Administration, and Arthur J. Lesser, M.D., Regional Medical Consultant, U. S. Children's Bureau.

It is reported that there was agreement at the Institute that health and medical services are important contributing factors to community morale. It was realized that such services are distributed among the population with more regard to the ability to pay than to actual need. It was concluded that the availability of health and medical services in rural areas should be regarded as a right rather than a luxury dependent upon individual or community purchasing power. Specific recommendations included:

(a) The further extension of existing public health services, with special emphasis on the local level, was urged. The system of public health districts developed by the Committee on Administrative Practice of the American Public Health Association and based upon population and area was approved in principle and its acceptance urged.

(b) The further extension of existing medical, dental, and nursing services including hospitals and clinic services was favored. Medical and Hospital facilities should be made available to all people regardless of their place of residence or their financial status. The war has shown a need for more physicians, especially in rural areas. Accordingly, provisions should be made for additional training facilities to meet the war and the anticipated postwar demand for medical care.

Some Factors Affecting the Early Diagnosis of Pulmonary Tuberculosis

Study of 230 Newly Reported Cases

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THE purpose of this investigation was to study some of the factors limiting the efficacy of case finding among symptomatic groups, to note differences in the potential value of contact examinations depending on the type of community, and to emphasize the important rôle of mass surveys of selected population groups in future tuberculosis control programs.

METHOD OF COLLECTING DATA

The exact time at which the patient first became aware of a departure from normal usually cannot be determined from hospital or clinic records. Even less satisfactory is the information from such records regarding history of illness among current or former contacts of the patient, not only with regard to tuberculosis, but concerning any suspicious symptoms referable to the chest. Furthermore, no detailed residence history is usually available, and it was desired to observe the variation of several factors according to a history in the past of residence in an urban versus a rural community.

Therefore, the primary source of the data was personal interview of patients. This was supplemented by reference to hospital, clinic, and public health records. Wherever there was a question of a contact having suspicious symptoms and there were relevant hospital or other medical records, these too were examined. In each case the family physician was consulted and the individual and family history discussed with him. As the patient interviews were all conducted by one individual, differences due to differing interpretation, approach, etc., were minimized.

The area selected for the study included three counties in upstate New York. Two were predominantly rural, the third included a city of about 200,000 population. In order that these personal interviews would be most productive, and so that the results would mirror as closely as possible the current picture of tuberculosis, the group selected included those cases reported for the first time during the year 1941 and still living in the same area. It will be noted that this was at the beginning of the war before mass radiography became relatively common.

Cases for which there was evidence of a previous report in the district roster were excluded. As the interviews were completed during the 8 months between October 1, 1941, and June 1, 1942, the loss by death of cases reported during 1941 was not high—56 of 353 cases (16 per cent).

It was found that these deceased cases could not be included because the de-

sired data to be used comparatively were not available from existing records. Of 251 patients still living in the area and capable of being interviewed, 230 (91.7 per cent) were located and are included in the investigation.

Each of the three counties has easily accessible chest clinic facilities, and in none was there a shortage of physicians at the time of the study.

The following information was obtained on each patient:

Identifying data—name, address, date of birth, marital status, sex, color, parents' birthplace, occupation, and attending physician.

Apparent onset—date and nature of first symptoms referable to the chest; date and reason for first medical consultation subsequent to these symptoms; first chest x-ray; date, by whom taken, by whom referred, and result; date and source of x-ray on which diagnosis was first made; place, date, and result of sputum examinations; reporting: date, by whom, stage and activity of disease at that time.

Treatment—dates of sanatorium residence or home "curing."

Residence—places of residence from birth to age of 15 years; from 15 to 30 years; and subsequently—with time spent in each place.

Contact history—included all persons with one month or more household association with the patient since the latter's birth; also any known extra-household contact who had been diagnosed tuberculous. Information secured on the former included: name, relation to the patient, address, age, presence of suspicious chest symptoms (at any time), x-ray examination if performed, current status (non-tuberculous, definite tuberculosis, or suspect), date and cause of death if deceased, and dates of contact with the patient.

The data were transferred to punch cards and mechanically sorted.

DIAGNOSIS

In 222 of the 230 cases the diagnosis was established by means of x-ray films; in 4 the original diagnosis was made on the basis of fluoroscopy, and in 3 on sputum examination. In one instance the disease was discovered at the time of an operation.

Over half of the cases (124) were reported by a chest clinic, 48 by a tuberculosis hospital, 48 by a private physician, and 10 by general or other hospitals.

Among the 230 patients there were 30 who had been diagnosed more than a year earlier but not reported as cases until 1941; and another 60 had been aware of symptoms referable to the chest for a period of more than a year before reporting. Thus, nearly 40 per cent of this group of newly reported patients had definite evidence of disease for a considerable period prior to reporting.

VARIOUS FACTORS RELATED TO STAGE OF DISEASE AT REPORTING

1. *Age and sex*—There was a greater proportion of minimal cases reported among females than among males. Table 1 shows that there were 40.7 per cent minimal cases among the former and only 30.3 per cent among the latter. This difference is also reflected in the

TABLE 1

Stage of Disease at Reporting According to Sex of Patients

Sex	All Stages		Tb. Pleurisy		Minimal		Mod. Adv.		Far Adv.		Stage at 1st Report Not Determined	
	No.	Per cent	No.	Per cent	No.	Per cent	No.	Per cent	No.	Per cent	No.	Per cent
Total	230	100	5	2.2	81	35.2	64	27.8	64	27.8	16	7.0
Male	122	100	2	1.6	37	30.3	34	27.9	40	32.8	9	7.4
Female	108	100	3	2.8	44	40.7	30	27.8	24	22.2	7	6.5

proportion of far advanced cases according to sex.

A possible explanation is offered in the observation that more of the symptomatic females consulted a physician within a month of their onset than did symptomatic males. This increased delay on the part of the men in securing medical attention was not limited to any one age group. In the ages 0–29 and over 30 years, the males had 45.2 per cent and 51.7 per cent respectively soliciting medical aid within a month following first symptoms; whereas the females had 65.8 per cent and 64.3 per cent respectively. It seems quite likely that this is a manifestation of the frequently observed tendency among male patients to belittle the importance of all but the most serious symptoms.

2. *Parental nativity*—Foreign population groups are generally considered to present more of a problem in tuberculosis control than other groups, particularly in urban areas. It is not always clear why this should be except where living conditions offer an explanation. Table 2 shows that in this study (where practically all of the patients were native born) the factor of parental nativity was not associated with any significant difference in the stage of disease at reporting.

Because of frequent unwillingness to be hospitalized these first generation natives are often thought to be uncooperative. However, so far as the original discovery of the disease is concerned they were not found to vary notably from the rest of the group: 54.8 per cent of the patients of native parentage sought medical advice within a month of their onsets and 52.2 per cent of patients of foreign parentage.

3. *Residence history*—Because of the long intervals frequently elapsing after tuberculous infection before overt signs of disease appear, not only the patient's whereabouts at the time of diagnosis but also his whole residence history is of interest. Because of the more frequent association between individuals in an urban society, the spread of any respiratory disease there might be expected to assume a different pattern than that in a rural area.

Of the 230 patients studied, 156 had lived for one year or more in a city of 100,000 population or greater; and 57 of the remaining 74 had lived all of their lives in places of 50,000 or less. There was no significant difference in the subjective manifestation of illness in those with and without extensive large city experience: Of the 156 patients residing in large cities 85.9 per cent were symptomatic, and of the 74 residing in rural areas 83.8 per cent had symptoms.

But there was observed a very definite difference in regard to the stage of disease at reporting. In the more urban-

TABLE 2

Stage of Disease at Reporting According to Parental Nativity

	All Stages		*Tb. Pleurisy*		*Minimal*		*Mod. Adv.*		*Far Adv.*		*Stage at 1st Report Not Determined*	
Parental Nativity	*No.*	*Per cent*	*No.*	*Per cent*	*No.*	*Per cent*	*No.*	*Per cent*	*No.*	*Per cent*	*No.*	*Per cent*
Total	230	100	5	2.2	81	35.2	64	27.8	64	27.8	16	7.0
Both native born	115	100	4	3.5	42	36.5	32	27.8	37	32.2	0	...
Both foreign born	84	100	1	1.2	33	39.3	27	32.1	23	27.4	0	...
Mixed parentage	14	100	0	...	5	...	5	...	4	...	0	...
Information incomplete	17	100	0	...	1	...	0	...	0	...	16	...

ized group there were only 30.8 per cent of minimal cases compared to 47.3 per cent in the more rural group. This seemed surprising in view of the fact that diagnostic facilities were, if anything, more easily available in the urban areas, and lay tuberculosis education probably had been more intensive there. Those patients who had been resident for some time in a rural area before being diagnosed showed a tendency to have more advanced lesions if they had a history of past urban experience.

This difference cannot be explained on the basis of age or sex differences. However, there is a residence-linked characteristic (known prior exposure) which may present an explanation, and which will be considered in the succeeding paragraphs.

4. *History of recognized tuberculosis contact*—Among the patients 139 (60.5 per cent) gave a history of known contact with a previously diagnosed case of tuberculosis. Table 3 shows the marked relation between antecedent household contact and the early discovery of the disease. This is due no doubt in part to the better understanding of the disease in those persons who have had such direct contact with it. Probably, too, it is largely due to the frequence of contact examination in that group before symptoms appear. This supposition is strengthened by the fact that in a small group of persons examined primarily because of contact alone, 15 out of 19 (79 per cent) were minimal on discovery. In a larger group (34) who were asymptomatic—regardless of the reason for the examination leading to their diagnosis—28 (82.3 per cent) were minimal.

As might be expected the history of recognized household contact was associated with slightly larger family groups —the 88 patients with such a history naming 685 current or past household associates for an average of 7.8; while 142 patients without such a history named 1,025 for an average of 7.2. Likewise multiple antecedent household contacts were associated with larger families; the median family size where there was no history of contact was six; with 1 recognized contact it was 7; with 2 it was 9; and with 3 it was 11.

In view of the earlier diagnoses among contact groups it is easier to understand the findings noted above regarding the higher proportion of minimal cases in persons of rural residence. For, as is seen in Table 4, 55.4 per cent of the more rural dwellers gave a history of previous household contact with a diagnosed case; and only 30.1 per cent of the urbanized patients gave a history of recognized household contact.

This would seem to be the natural manifestation of the greater hazard of tuberculous infection from unrecognized sources in areas of greater concentration of population. In the less concentrated areas actual physical association between

TABLE 3

Stage of Disease at Reporting According to History of Recognized Antecedent Contact

History of Contact	All Stages		Tb. Pleurisy		Minimal		Mod. Adv.		Far Adv.		Stage at 1st Report Not Determined	
	No.	Per cent	No.	Per cent	No.	Per cent	No.	Per cent	No.	Per cent	No.	Per cent
Total	230	100	5	2.2	81	35.2	64	27.8	64	27.8	16	7.0
Household	88	100	1	1.2	43	51.8	22	26.5	16	19.3	1	1.2
Extra household	51	100	1	2.1	14	29.2	14	29.2	19	39.6	1	...
No recoznized contact	91	100	3	3.6	29	28.6	28	33.3	29	34.5	0	...

TABLE 4

History of Recognized Tuberculosis Contact According to Patient's Residence

History of Contact	Total	Residence for One Year or More in a City of 100,000 or Greater		Residence Solely in Smaller Places	
		No.	Per cent	No.	Per cent
Total	230	156	100	74	100
Household	88	47	30.1	41	55.4
Extra household	51	36	23.1	15	20.3
No recognized contact	91	73	46.8	18	24.3

persons is more likely to be focalized in the home, with proportionately less intimate contact between persons outside of their own family circles.

This is of considerable importance from an administrative point of view for it delineates to some extent the differing part that contact investigations should play in the over-all control program in rural and urban areas. Obviously the 70 per cent of urban patients discovered with no known antecedent household contact would not have benefited by a more extensive and complete examination of the household contacts of known cases. To discover them earlier it would have been necessary to have done one of two things: Either secure more prompt action by patient and physician after symptoms developed; or discover them before the appearance of symptoms by means of mass x-raying other than that of the household contacts of known cases. The first possibility will be considered next.

5. *Delay by the patient*—At one time it was felt that intensive lay education regarding the " symptoms of early tuberculosis " might be the solution to early diagnosis. Undoubtedly the longer a patient delays after symptoms develop before seeking medical attention, the more extensive his lesion will be on diagnosis. Table 5 illustrates this point, 47.8 per cent of the patients being far advanced who delayed more than a month in seeking medical advice, whereas only 28.4 per cent were far advanced who had gone to a doctor within a month of the onset of symptoms.

But other important considerations

TABLE 5

Stage of Disease at Reporting According to Manner of Onset and Delay in Seeking Medical Attention *

Interval from Onset to Medical Consultation; and Stage of Disease at Reporting	Total		Initial Symptoms: Chronic Cough or Constitutional Only		Hemoptosis Febrile Illness or Pleurisy		Other Symptoms Related to Chest	
	No.	Per cent	No.	Per cent	No.	Per cent	No.	Per cent
Less than 1 month:	88	100.0	31	100.0	54	100.0	3	...
Pleurisy	5	5.7	1	3.2	4	7.4	0	...
Minimal	25	28.4	7	22.6	18	33.3	0	...
Mod. advanced	33	37.5	15	48.4	18	33.3	0	...
Far advanced	25	28.4	8	25.8	14	26.0	3	...
More than 1 month:	69	100.0	52	100.0	15	100.0	2	...
Minimal	15	21.8	10	19.2	4	26.6	1	...
Mod. advanced	20	29.0	14	26.9	6	40.0	0	...
Far advanced	33	47.8	27	52.0	5	33.4	1	...
Not reported	1	1.4	1	1.9	0		0	...

* Excluding 40 patients with no medical consultation and 33 patients diagnosed prior to 1941

are involved. It is apparent that the nature of the first symptoms are very important. In the 83 patients with an insidious onset, even those who sought medical care promptly (37.4 per cent saw a doctor within 1 month) benefited little from their good "reaction time" as but 22.6 per cent were minimal when reported. Even with the more alarming types of onset, early medical consultation (78.2 per cent saw a doctor within 1 month) resulted in but one-third of the patients being diagnosed in the minimal stage.

This does not present a very encouraging picture of the possibilities of early diagnosis among symptomatic patients. In the nature of the disease we must expect a considerable proportion of cases to continue to present a slight cough, weakness, loss of weight, or other equally nonspecific symptoms as the initial manifestation. Even in the presence of adequate lay education as to the occurrence of such symptoms in tuberculosis, it remains more probable that they will be interpreted at first on the more common basis of a "cold," "sinus trouble," "over-work," etc.

Figure 1 illustrates the time lag in securing medical attention as related to the reporting of the cases after such consultation. It is seen that medical consultation was reasonably prompt, with over 70 per cent of the patients having seen a physician within 2 months after symptoms appeared.

Age alone had little to do with this lag, 56.5 per cent of the symptomatic patients under 30 having seen their doctor within a month and 55.7 per cent of those 30 years or over having done so (See Table 6). However, the young adult males showed a definite tendency to procrastinate longer than females of the same age group.

6. *Delay by the physician*—The diagnosis of early tuberculosis is often ex-

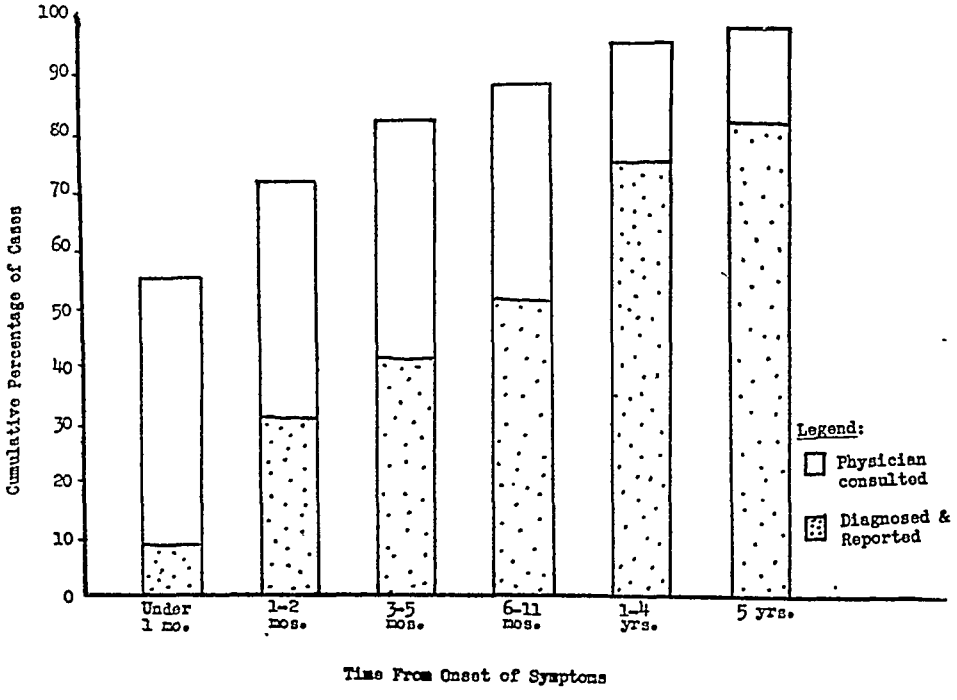


FIGURE 1—Intervals between onset and medical consultation and between onset and reporting for 184 patients with symptoms referable to the chest

TABLE 6

Patients With an Interval from Onset of Symptoms to First Medical Consultation of Less Than 1 Month According to Sex and Age *

	Both Sexes			Male			Female		
		Patients With Lag of Less Than 1 Month			Patients With Lag of Less Than 1 Month			Patients With Lag of Less Than 1 Month	
Age	Total	No.	Per cent	Total	No.	Per cent	Total	No.	Per cent
All ages	157	88	56.0	91	45	49.4	66	43	65.2
Under 15 yrs.	2	1	56.5	1	0		1	1	
15–29 yrs.	67	38		30	14	41.2	37	24	64.8
30–59 yrs.	71	40	55.7	51	29	56.8	20	11	55.0
60 and over	17	9		9	2		8	7	

* Excluding 40 patients with no medical consultation, and 33 patients diagnosed prior to 1941

TABLE 7

Interval from Medical Consultation to First X-ray According to Sex

	Total		Male		Female	
	230					
Interval	No.	Per cent	No.	Per cent	No.	Per cent
With medical consultation	184	100.0	99	100.0	85	100.0
Less than 1 month	93	50.6	53	53.5	40	47.1
1– 2 months	31	16.9	15	15.1	16	18.8
3– 5 months	11	6.0	6	6.1	5	5.9
6–11 months	13	7.1	6	6.1	7	8.2
1– 4 yrs.	17	9.2	9	9.1	8	9.4
5– 9 yrs	4	2.1	1	1.0	3	3.5
10 or more yrs.	15	8.1	9	9.1	6	7.1
No medical consultation	46		23		23	

tremely difficult in practice. It would be expected that a considerable delay might occur in securing a diagnosis in some patients after they sought medical advice. It has been seen (Figure 1) that there was a rather pronounced lag in reporting cases to the health department. This is unfortunate in that it delays the initiation of a concerted attempt to secure hospitalization and to institute control measures in the home.

There was also a considerable delay noted in securing the initial x-ray after first medical consultation. As indicated in Table 7, 67.5 per cent had been so examined within 60 days' time, but after that interval there were 60 patients who did not get an x-ray for months or even years.

The likelihood of long delays in securing the x-ray needed to give a definite diagnosis increased with the age of the patient. There was no observed difference between the sexes in this regard. Table 8 shows that many of the instances of considerable delay occurred in the older age groups. This emphasizes again the relative importance of suspecting the elderly patient with symptoms —the patient with "bronchitis," or "asthma"—on whom an x-ray of the chest should be done routinely at the earliest possible moment.

Time studies of the various lags described have not been frequently reported. Chapman [2] reported a similar analysis of 200 patients in 1928. It is interesting that at that time he found 61 per cent of his cases had consulted

TABLE 8

Interval from Medical Consultation to X-ray According to Age at Diagnosis (Excluding 46 Cases Without Medical Consultation)

Interval	All Ages	0–14 Yrs.		15–29 Yrs.		30–59 Yrs.		60 Yrs. and Over	
		No.	Per cent	No.	Per cent	No.	Per cent	No.	Per cent
Total	184	3	..	82	100.0	82	100.0	17	100.0
Less than 1 month	93	2	..	49	59.8	36	43.9	6	35.3
1 mo.–1 yr.	55	0	..	28	34.1	25	30.5	2	11.8
Over 1 yr.	36	1	..	5	6.1	21	25.6	9	52.9

a doctor within 1 month of their first symptoms. In spite of the extensive lay education since that time regarding the symptoms of tuberculosis the proportion of cases in this study who acted that promptly was almost identical (59.8 per cent).

Nicholson [4] recorded a similar interval for her series in Detroit—again 61 per cent having seen a physician within 1 month of their onset. This is of particular interest in that her study included only fatal cases, and the median interval between diagnosis and death was only 6 months.

More recently Mann [3] has reported a similar analysis of the steps leading to a diagnosis of tuberculosis in England. It is not possible to compare his findings with those mentioned above because of different statistical treatment of the material. He did, however, observe the same tendency to increased lags in the older age groups and emphasized the point that much of the delay in instituting early treatment is due to the development of tuberculosis without symptoms or with only "nonspecific" subjective manifestations.

Pope and Chadwick [5] have recently pointed out the importance of determining the proportion of currently discovered cases associated with antecedent contact with a diagnosed case, as some measure of the value of contact examinations. The difference observed in this study between urban and rural areas suggests again the relatively greater importance of the examination of household contacts in rural areas, and the greater need of additional case finding procedures besides contact examinations in the cities.

DISCUSSION

Both from the clinical and the public health viewpoint the early diagnosis of tuberculosis is extremely important. Except for differences in inherent resistance, the prognosis depends largely on the stage of disease at which treatment is instituted. Even if an effective drug is discovered, the degree of pulmonary damage prior to its use in any individual case will undoubtedly determine the period and extent of disability.

Similarly the community suffers an infection hazard from each case which is proportionate to the interval between beginning infectiousness and institution of proper control measures. This interval is a function of the promptness of diagnosis wherever adequate facilities for the treatment, segregation, and education of discovered cases are available and properly utilized.

Furthermore, lay coöperation in any control program is likely to be conditioned by the experience of laymen regarding the measures advised. And when the majority of tuberculous patients are diagnosed in an advanced stage, popular conceptions of the efficacy of sanatorium care are formed on the basis of the discouraging results observed in treating those late cases. Only when it is usual for tuberculosis to be diagnosed early will the dread of sana-

toria disappear and a confidence in current treatment methods become common.

Part of the unsatisfactory results of our older control measures was attributable to the insidious nature of the disease. For many years the chief emphasis in lay education was on symptoms, and our principal professional implements were physician education and consultation clinics for patients with complaints referable to the chest. These measures were obviously incomplete in view of statements by eminent chest specialists that as high as 60 to 70 per cent of patients have advanced lesions by the time they are aware of their illness.[1]

It is important to consider carefully what portion of a tuberculosis control program should be based upon the symptomatic patient and what portion on an aggressive case finding effort aimed at people who are not yet ill. Each requires specific administrative, clinical and technical personnel and equipment peculiar to its own needs.

The "reaction time" of the patient with symptoms in soliciting medical aid must affect in some degree the stage at which his disease is discovered. This particular lag has been measured in the past [2] before the laity was as well informed as it is today. Yet the lag has not changed appreciably when compared to that observed in this study and by other more recent investigators.[3] It is a moot point as to how much the yield of early cases from symptomatic patients might be increased by more intensive work with these ill persons.

During the past few years, and especially since the outbreak of the war, we have gone on the offensive against tuberculosis, no longer waiting for it to make itself apparent before going into action against it, but searching it out where we know it has not yet become firmly entrenched. A beginning was made in this direction with attempts to x-ray all household contacts of reported cases. Though mostly without symptoms, this group has yielded good returns both of total cases and of early cases. More recently this has been supplemented by extensive examinations of other asymptomatic groups—selective service inductees, industrial workers, low income and colored groups, etc. The development of fluorography and paper film methods has made the future extension of such mass surveys feasible and economical.

The provision of diagnostic services for patients with chest ailments must remain one of our basic needs in controlling tuberculosis. But in order to increase substantially the proportion of early cases diagnosed, more is needed than an increased effectiveness of the handling of symptomatic patients. In this group, even when both patient and physician acted promptly after symptoms appeared, less than half of the cases were minimal when reported.

The proportion of minimal lesions discovered among patients examined for reasons other than symptoms was very considerably higher. The use of mass chest x-ray surveys of selected population groups would seem to be the method of choice in securing earlier diagnosis which in turn should affect all phases of tuberculosis control activities through the greater efficacy of treatment in patients with less extensive pulmonary damage.

SUMMARY

Two hundred and thirty recently reported cases of pulmonary tuberculosis and their household contacts were investigated. In addition to the information routinely available from clinic and hospital records, the patients were questioned in detail as to the reasons for their first medical consultation.

The time lags were determined between appearance of symptoms and seeking medical care; between the first visit to a physician (for symptoms refer-

able to the chest) and the initial x-ray; between that x-ray and a definite diagnosis of tuberculosis; and between that diagnosis and reporting of the case to the health department.

The observations recorded indicate that case finding among symptomatic patients cannot be expected to result in a majority of those patients being discovered at a minimal stage; and contact examination among associates of diagnosed patients, although yielding a high proportion of early cases, is limited in its scope, especially among urban residents. Mass roentgenography would appear to be needed if substantial reduction of cases which are advanced at the time of discovery is to be achieved.

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Rapid Treatment For Gonorrhea With Penicillin

Rapid and simplified methods for treating gonorrhea with penicillin which require no hospital care for the patient and which can be used conveniently by physicians in private practice or by clinics were recently reported by physicians of the U. S. Public Health Service, Washington, in connection with the Service's responsibility for treatment of men from the Coast Guard and Merchant Marine. One schedule of five treatments can be completed in 7½ hours.

Patients are required to be at the clinic for only a few minutes at each of the five or six times designated for penicillin injections. These rapid treatment schedules were developed because of the urgency of returning men to active duty. According to these reports, the new methods have been effective in almost as large a percentage of cases as the standard 12 to 21 hour treatment schedules. These so-called out-patient schedules of treatment were developed by Drs. C. J. Van Slyke of the Venereal Disease Research Laboratory, Staten Island, N. Y., and S. Steinberg of the U. S. Marine Hospital, New York, N. Y.

Merit System in Public Health

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PRESIDENT Garfield was assassinated by a disappointed office seeker. His death resulted in the birth of the Federal Civil Service Act in 1883. Provisions of this Act were well conceived. They have guided states and cities in the formulation of their civil service legislation.

A merit system as generally understood is a civil service without benefit of legislation. Authorization for its development is based upon regulation and not law. Their objectives are the same. Briefly stated, these are: (1) selection of personnel by open competitive examinations admission to which is based upon qualifications and experience; (2) provision of promotions and increased compensation based upon proven ability and length of service; and (3) elimination of partisan politics in the selection, appointment and promotion of personnel.

Representative Fulbright of Arkansas made the following pertinent remarks[1]:

"Most of the faults in government can be traced to personnel. Business, because it is profitable, has attracted the smartest people. If you can have a good government—a reasonable, honest and clean government with intelligent people in it—other problems will solve themselves."

It is our desire to present to the public health worker information about the merit system; what it is, how it works, its advantages to the individual and to the public, and finally to list the progress that has been made up to the present time. Our experience leads us to believe that many persons in public health have not been well informed about this program. Their complete understanding and intelligent support are vital for the development of a successful merit system.

Public health leaders have long appreciated the need for making public health positions more attractive in order to secure and retain qualified and experienced workers. Several of the foundations, notably Rockefeller, Kellogg, and Commonwealth, have done much to stimulate improvements in public health organizations and to encourage graduate training of professional workers in public health. These foundations together with the U. S. Public Health Service and the American Public Health Association have shown that capable personnel are essential to provide efficient, economical public health services to American communities. It was demonstrated that the death rate from typhoid fever in any community could be maintained at zero; that children need never die of diphtheria; that no community need have an outbreak of smallpox; that milk safe for human consumption could be produced; that public water supplies could be developed which would not carry contamination into homes; and, in general, that an extremely low death rate from communicable diseases in any community is very largely a purchasable commodity, provided that trained and efficient public health personnel are employed and are not hamstrung by vested interests.

These demonstrations were well known to the state health officers at the time of passage of the Social Security Act of 1935. Title VI of this Act gave authority for the appropriation of funds to be administered by the Public Health Service (through the state health authorities) for the purpose of assisting state and local public health agencies in developing and expanding such health services, and in providing funds to be used for training personnel. These funds are allotted to the states by the Public Health Service and have given decided impetus to the development of state and local health departments manned by full-time qualified personnel.

Since 1936, the state health officers have invested annually more than one million dollars of these funds in training personnel. There has accrued a valuable backlog of investment in trained personnel. Our American armed forces have drawn heavily on this supply of trained specialists to insure the protection of the health of our fighting forces. The states are maintaining their training programs to a considerable extent even during the war period.

Expenditure of such large sums annually for this necessary and worth while purpose receives full support and encouragement from the Public Health Service and the Children's Bureau. These agencies, being charged with responsibility for administering federal funds through states for public health improvement are vitally interested in the careful selection of trainees and in the establishment of adequate standards for their employment in public health work following training.

After such sums of money have been spent on these individuals to insure their greater effectiveness, it is true economy and efficiency to encourage their retention in public health work by providing: an equitable compensation plan, opportunities for advancement based upon qualifications of training, experience and ability; and last but not least, freeing employment from partisan politics, personal favors, and family ties.

Amendments to the Social Security Act passed in 1939 by The Congress provided that states submit plans for personnel administration on a merit basis to certain federal agencies administering funds made available by the Act. Those agencies which were not included in these amendments, wrote into their administrative regulations a requirement similar to that imposed on the other agencies by Congressional Act. Thus, administrative plans for the funds made available to state and local governments for Social Security programs, including public health, require that state and local units of government employ personnel and administer the activities of personnel under a merit system which is acceptable to the federal administrative agency.

Regulations and policies of the U. S. Public Health Service for the administration of funds through grants-in-aid to the states include certain standards for state plans of personnel administration. These policies and regulations are established by the Surgeon General of the U. S. Public Health Service after consideration and approval by the Conference of State and Territorial Health Officers. The Public Health Service reviews plans for personnel administration as they affect public health personnel in the states.

In addition to the responsibilities placed directly on the Public Health Service by Congressional Acts, there are certain relationships with other federal agencies which often involve the Public Health Service. The Social Security Board of the Federal Security Agency also has certain responsibilities conferred by The Congress in regard to personnel within the states. Under varying types of organization the re-

sponsibilities placed on the Board and the Public Health Service are in some states administered through the same department. It is therefore desirable that the basic policies and regulations of these two agencies be uniform.

The Children's Bureau of the U. S. Department of Labor also shares this responsibility and participates in all state health programs. These three federal agencies make every effort to develop uniform standards for recommendation to the states. Harmonious agreement and clearance in regard to policies of personnel administration in state plans have been developed.

In addition the Hatch Act places certain responsibilities on federal agencies administering grant-in-aid funds.

Progress in state programs of personnel administration for public health employees is divided into three parts: (1) merit system rules including State Civil Service laws; (2) classification, compensation schedules, and (3) operating procedures.

Proposed rules for merit system organization (including 20 states with Civil Service laws which encompass health department employees) have been prepared by each of the states. Provision is made for a council or board which is responsible for policies and guidance. An executive officer of the Merit System program is required by rule or law and his duties and jurisdictions are specified. Agency personnel officers and their duties are given. Among other provisions included in these rules are: (1) method of selection of council and supervisor; (2) selection of personnel by examination; (3) procedures for various types of appointments, leaves, separations, disciplinary actions, reinstatements, appeals, and other personnel actions; (4) general characteristics of the classification-compensations schedules; (5) procedures of payroll certification.

True to the democratic organization of our states these rules differ in their content in accordance with various state laws and regulations and the circumstances which prevail in the respective states. Throughout, however, the plans and regulations conform in general to sound principles of public personnel administration. Rules and laws of 42 states have been accepted as being in substantial conformity with the Merit System policies of the Public Health Service as of July 1, 1944. States have met more difficulty in developing classification-compensation plans than in formulation of rules and laws. Analyses of positions, required preparation through training and experience for these positions and the establishment of equitable rates of pay have been stumbling blocks. Gradually the states are making progress in solving these problems, but at present only 14 of the states have submitted plans which conform to the standards of the Public Health Service.

Much profitable effort has been expended by the states in preparation of classification-compensation plans based on job descriptions, degree of responsibility in the position, degree of hazard to the employee, etc. This process has led to more basic alignment of positions within departments, consideration and reconsideration of requirements for professional and sub-professional positions, optimum ratios of professional to sub-professional personnel in the various public health activities, adjustment of salaries toward equity of pay for equal work, responsibility and hazard of employment and utilization of compensation schedules in budget planning. Past personnel practices have been carefully scrutinized by many public health administrators and progressive steps made by salvaging the better of these and instituting more desirable practices in lieu of those practices found undesirable. Adoption of well considered compensation-classification schedules by state

and local health authorities have proved to be economical per unit of service rendered; have produced a stable base for future personnel actions; have stimulated individual employees toward self-improvement; and have enhanced the security and stability of the group. Timely adjustments of classification-compensation schedules have gone far toward alleviating stresses of personnel shortage precipitated by the national emergency. States having the more progressive plans and more adequate installations of personnel administration have tended to suffer less from personnel shortage during the emergency although each state has made great contribution in specialized personnel to the military services and to war industry during this period.

Advantages in the field of public health work which experience has shown to accrue from a sound merit system program include:

1. A uniform, publicly-known procedure through which competent qualified personnel may be employed. All recruitment is difficult in wartime. Part of the difficulty lies in the reluctance to assign to auxiliary personnel tasks which formerly were done by professional classes. Probably the largest obstacle is the inability or unwillingness to compete with industry and private enterprise in financial compensation for the services rendered. We are fettered by tradition and custom in paying low salaries to public health workers. Also, many additional responsibilities have been placed upon public health departments demanding new and additional services. There is nothing in a sound state merit system which increases recruitment difficulties that have not been placed there by the agency responsible and which cannot be removed. Realistic revisions of merit system plans have been offered by many state health authorities. These have been welcomed by the Public Health Service and referred to other states for consideration. States have been urged to include in their merit system classification plans on " emergency class " for the duration of the emergency or until personnel qualified for standard classes become available. Modified duties and responsibilities, with sub-standard qualifications, are proposed for such positions. As an example, the standard class specification may call for graduation of the nurse from a hospital having at least 100 daily bed patient average. During the emergency, however, nurses from smaller hospitals can be taken to perform less responsible work under more immediate supervision. It is reasonable to suppose that there will be some respite from the dearth of professional personnel shortly following the war, but the potential problems necessitate leadership and masterful planning on the part of public health administrators, those who train public health specialists, and the personnel officers of state and local health departments.

2. A procedure for the training of persons for a career service in public health.

3. Establishment, as a basis for personnel selection, of qualifications and experience necessary for particular positions.

The American Public Health Association, through the Subcommittee on Merit Systems of the Committee on Professional Education, has performed an excellent service, both in stimulating interest in the development of merit system programs and in providing test items to be used in the examination of persons in the several specialties. Items are suggested by qualified persons in the field. These are reviewed, edited, and made available to the states.

Sixty-five examinations in the field of public health nursing have been given in 15 states and 1 city. Examination material has been prepared in the field of public health nursing, nurse-mid-

wifery, and orthopedic nursing. Test items are also available for administrative health officers, laboratory programs, and environmental sanitation.

4. Standardized compensation schedules for positions demanding comparable qualifications and pay increases based on efficiency and length of service.

5. Provision of more economical and efficient public service through the employment of competent and qualified personnel who are motivated by a desire to render service rather than to seek special favors.

6. Plans on which retirement benefits may be based.

7. Protection for the public health worker from influences resulting from political changes, from the whims of administrators, and the elimination of at least some of the confusion which may accompany a change in state or local political power. On the other hand, methods are provided for the administrator to discharge employees who do not develop and progress as normally expected. But the employee is discharged for cause, with a public hearing if requested. Meriam[2] states that "in the national government, the truth is that it is easier to fire a classified civil service employee than it is to fire the employee who holds office by virtue of live, current political connections."

8. Reduction of effect of pressure groups on personnel administration, allowing the administrator more time for his work in public health.

When the personnel of state and local health departments enjoy a reasonable degree of security, and when plans have been put into operation and are known to the personnel for whom they are prepared and to the educational institutions preparing those who would choose careers in the specialties of public health, then considerable progress will have been made. At present there is much to be desired in the actual operations of the states' personnel administration programs. These operations take time to institute even when there is the best intent on the part of administrators. Experience in working with state and local public health administrators indicates that problems of personnel are and have always been the most persistent and most important. This was true before the emergency as well as now. Personnel selection, retention, and general improvement in standards of employment will be one of the major problems of public administrators after this emergency. Some public health administrators show little desire to develop progressive plans for personnel administration. There are a few who openly prefer political partisan practices including selection and retention of officers and others charged with protecting the health of the public on the bases of friendship, personal favors, and family ties, rather than qualifications of ability, training, and experience. Fortunately few of the latter type administrators become interested in public health services.

Petty politics have proved of little assistance in offering protection against diphtheria, typhoid fever, in the reduction of incidence of venereal disease, or in the solution of other public health problems. Full-time qualified public health personnel have proved quite efficient in reducing disease incidence and in raising the health level of communities. Continued public health progress in the United States depends materially on the quality of service rendered by state and local health department personnel. Provisions for equity of pay for equal work, recognition of responsibility involved, and hazard of the work of the employee will contribute to the elimination of disease hazards. Other phases of sound personnel administration, too, must be utilized in order that qualified persons

may be selected and retained to render service over continuing periods of time —that there may be incentive to study and progress as a public health worker —there may be reasonable security for the meritorious worker—the "dead wood" of health departments may be systematically eliminated.

Basic plans for such procedures have been laid. Their fulfillment rests in the hands of administrators. The blue print is ready—construction of fully effective programs has yet to be accomplished in most states.

Problems of personnel administration are never static. Following World War I a series of problems were presented; the depression period brought entirely different problems with a lush and overabundant labor market; whereas, our present emergency period has produced a great shortage of labor. What the nature of personnel supply will be following this war period is pure conjecture, but it seems reasonable to suppose that state and local health departments will not be able to secure for some time thereafter an adequate supply of trained public health workers. If this proves to be the case, planning for training of personnel will be essential. Plans should be completed for determining how those who have been in the military services of the nation and those who return from essential war industries may be included in public health programs. If industry expands in the post-war period and continues to demand the entire labor supply, public health agencies may continue to have need for aggressive personnel policies.

CONCLUSION

It has been stated: "The health officer occupies the position of agent to whom the public entrusts certain of its resources in public money and coöperation to be so invested that they may yield the best returns in health."[3] If this be true, the health officer must have a system by which capable personnel can be selected and retained in order that he may fulfil his obligations to the community in the protection and promotion of its health. Personnel determine the success or failure of any organization, private or public.

A merit system provides a means of attracting and retaining qualified and experienced individuals. This is accomplished by open competitive examinations, selection on basis of merit, promotions to those demonstrating initiative and ability plus length of service, and finally compensation commensurate with the responsibility of the position. Concisely, a merit system for public health departments provides a career service in place of the haphazard type of personnel administration now commonly, of necessity, employed.

The advantages of a merit system are many, both to the public and to the employees. Taxpayers' returns in health can be best achieved by full-time well qualified professional personnel selected on the basis of merit and experience through well administered, competitive examination.

Sound personnel administration within state and local health departments is a responsibility of the state and local administrative health officers.

The strength of America is its man power. Disease is man's worst enemy. The employment of inefficient, dissatisfied personnel hamstrung by vested interests and by penny-wise dollar-foolish budgets amounts to sabotage in any community's war against disease.

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Popular Health Education

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NO matter what the authorities do on behalf of the public health, their measures will fall short of maximum success unless the individuals of the community accord ready and intelligent coöperation. To this extent it can be said that the individual himself is often the final arbiter in regard to his state of health. It is thus of first importance to interest the public in medical measures and to teach them self-help in health matters. It is to these ends that popular health education is practised.

The commercial publicist indicates to us many principles worth emulating, such as continuity of effort, novelty of presentation, and the objective approach.

The health publicist enjoys advantages, for it is certain that the people want what he is out to offer them. Then there is the point that, whereas the commercial advertiser has to face competition, health educators are all, as it were, advertising the same commodity.

Although an analogy with commercial practice is helpful, it is to be emphasized that health education comes essentially within the professional sphere and must retain a scientific basis.

ENGLISH PRACTICE

The Ministry of Health takes the initiative centrally in regard to popular health education, and in wartime works in complementary fashion with the Ministry of Information in this matter. In practice much is delegated to a body known as the Central Council for Health Education acting as agent for the Ministry of Health in this connection. The Central Council is widely representative, and among the bodies that nominate members to it are the Ministry of Health, the Board of Education, the Society of Medical Officers of Health, the British Medical Association, and various associations of local authorities.

In the past there has been a large number of separate voluntary bodies each dealing with some limited aspect of health education. Many of these still exist; but the tendency is to rationalize the position and to widen the scope of the Central Council.

During the war, the Ministries of Health and Information and the Central Council have increased notably the output of health propaganda. In these activities they work as far as possible through the well tested machinery of the local authorities and their public health departments.

The wartime posters produced centrally have reached a consistently high standard. No instance of this is more striking than the series of posters designed to illustrate the slogan "Coughs and Sneezes Spread Diseases." The primary injunction is to make proper use of the handkerchief in order "to trap the germs."

Antivenereal disease propaganda, in

* Guest of the American Public Health Association at the fourteen state and regional meetings during May and June, 1944.

the form of posters, articles, and advertisements in the national newspapers and journals, has also been persistent and striking. Some measure of its effectiveness is to be found in the marked increase at all venereal disease treatment centers of the persons attending for examination at the centers and found to be "not V.D."

BROADCASTS

From time to time, during the past two years or so the Chief Medical Officer of the Ministry of Health (Sir Wilson Jameson, K.C.B., M.D.,) has talked on the air in convincing fashion on outstanding health topics. His broadcasts on the venereal disease problem and on immunization against diphtheria are classics.

Popular features in the British broadcasting program are the regular talks by the "Radio Doctor." In these talks, everyday health matters are dealt with in a scientific but homely way.

A good medium of health education is also provided by the BBC in the form of discussions—sometimes between experts and sometimes between ordinary folk—on health subjects.

FILMS

In regard to health propaganda films, large, popular and "unconverted" audiences are most readily to be found in the ordinary commercial picture houses. Here at once is a difficulty for a health film—with, for example, an antivenereal disease narrative—as it must often sacrifice scientific and ethical qualities if it is to be a box-office draw.

Then again a propaganda film may often suffer from a wrong type of "supporting" program, as, for instance, at a well known cinema where I saw as a complement to the film "Social Enemy No. 1," another entitled "Ladies Crave Excitement"!!

The production of health films—above all antivenereal disease films—should preferably be outside the commercial sphere, and the films should be prepared under scientific direction. In addition to the picture houses, there are plenty of useful fields for the showing of such films, as, for example, in the factories. First class films are in fact readily available through the official agencies already mentioned.

SEX INSTRUCTION TO YOUNG PEOPLE

In the campaign against venereal diseases, sex instruction to young people is of basic importance. In my own City of Coventry, much work has recently been done along these lines in the youth centers.

At each center a special meeting is arranged from time to time consisting of three sessions, viz.: (a) a half-hour talk to the girls, (b) a half-hour talk to the boys, and (c) a mixed session on "brains trust" lines. The talks are made by a doctor and the brains trust is composed of a doctor, a youth organizer, and a school teacher.

The talks deal with the nature of the sex organs, and with reproduction. Although the wording of the talks is simple and direct, the scientific basis is preserved. In the girls' group special information is given on menstruation. In each group brief reference is made to the nature and dangers of venereal disease.

At each center, attendance at the sex instruction meetings is of course voluntary and normal club activities are available on the same evenings for any boys and girls who elect not to attend the meetings. The large majority do in fact attend. It is interesting to note that the reaction of the parents of the young people concerned has been universally favorable to this work.

SEX INSTRUCTION IN SCHOOLS

The policy in regard to sex instruction in schools is probably more progressive in America than in Britain

at the present time. In Britain, however, there is a growing advocacy on behalf of this branch of education, and in fact much useful work is already being done on these lines.

There is no doubt that it is easier for the teacher (assuming a proper training for the work) to impart sex knowledge than it is for the parent, for even doctors will say that it is less difficult to tell these things to other people's children than to their own.

It seems clear that no child should leave school without a simple knowledge of the form and functions of the reproductive organs. To achieve this, the teachers should lead up through plant and animal life to the human process. Vocabulary is all important in order that the sordid terms so often picked up by school children may be avoided.

Instruction in simple general hygiene and in the health work of local authorities is also vitally important and this is now pretty general in British schools today. Visits by the older girls to infant welfare centers, etc., and visits by the older boys to waterworks, etc., form an indispensable part of the work.

THE MEDICAL BRAINS TRUST

The " brains trust " idea * has won a wide acceptance and in no quarter is it more popular than among the workers. It represents education in a palatable form. It has the advantage that it deals with points of real popular interest—because the questions dealt with are posed by the listeners themselves. A big attraction is the genuine spontaneity of the answers. The conversational nature of the brains trust session, too, is in happy contrast with the formality of the average lecture or " pep " talk. The brains trust has great possibilities in health education.

* Corresponds with the " Information, Please " pattern.

Recently in the Rootes' Group of large engineering works in England a series of Health Weeks was arranged through the enlightened policy of the managements and in each the program included a Medical Brains Trust. This undoubtedly was the most popular feature.

Before the day of the brains trust session, the workers had been invited to submit their questions, and prizes were offered by the management for the best questions. The entries were judged in secret by a special committee and the best dozen questions were selected to put to the brains trust. Needless to say the members of the trust had no previous knowledge as to the nature of the questions.

The typical scene is a large factory canteen during the lunch hour. There are some 6,000 workers seated at their meal—truly a grand audience. There are four of us on the trust and the question-master. The managing director introduces the question-master, who in turn introduces us. We sit round a table on a platform at one end of the huge canteen with loud-speakers before us.

QUESTIONS AND ANSWERS

At a typical factory brains trust session the following were the questions put and the answers given. The answers will of course be obvious to a medical audience but they are included merely for purposes of completeness.

The first question is a far-reaching one: " Is it not time for a certificate of good general health to be produced as a condition of marriage? " We all agree that a certificate of freedom from transmissible disease—venereal disease, for example—is obviously desirable in respect of persons proposing marriage. It is the majority opinion, however, that medical certificates of fitness at marriage should not be required compulsorily until a strong

antecedent public opinion is more in evidence.

The next question is: "Do you think that work in modern factories is detrimental to the health of middle-aged women who have been drafted to industry?" We note here the reference to modern factories which presupposes good environmental conditions. The view is expressed that the ills of middle age in women tend to be exaggerated. Thus given decent working conditions —and reasonable travelling facilities to and from the factory—war work in the factory is not likely to harm the health of the workers in question.

Now comes the question: "The health of the people in this country has been better in wartime; will the brains trust give the reasons for this?" Rationing and food supplies are obviously a main issue here, and it is generally agreed that present conditions have resulted in a more equitable distribution of essential foodstuffs, and that all get sufficient to maintain health. In regard to child nutrition, the policy of the Ministry of Food in distributing fruit juices is commended. A point that is well brought out is the psychological satisfaction of useful work and the present absence of unemployment.

The inevitable question now follows, viz.: "Can venereal infection occur through any means other than sex relationship with an infected person?" The answer here is—for all intents and purposes, no! The notion that venereal disease can be contracted from infected towels, closet-seats, etc., is largely erroneous. Such an event is in fact extremely rare.

Question number five is: "In connection with the blood donor scheme, what prevents infections like syphilis being transferred from donor to receiver?" The reply is of course that the blood of donors is suitably tested and grouped before possible use.

The next question is of quite a different kind. "Flat feet and malformed feet appear to be very prevalent; what are the causes?" We deal at some length with the factor of incorrect footwear, and indicate the right types of shoes, notably for children. The value of corrective exercises is emphasized.

Time permitted of one more question only at this session, viz.: "School children have regular medical and dental inspections; would it be a good thing if this could be continued after school-leaving age?" Our answer is in the affirmative. It is agreed that regular overhaul by the family doctor and dentist at given intervals would be a good thing for the general population, because by this means departures from the normal would be ascertained at an early stage when treatment would readily be effective. It is mentioned that, in America, life insurance offices commonly offer these facilities free of charge to their policyholders, the idea being to lengthen the lives of persons insured with them.

CONCLUSION

It has been essayed to deal briefly with a few aspects of the theory and practice of popular health education. In spite of all official efforts in this field, there is yet much to be done. The greatest advance of all will come when the family doctor elects to become a missionary of preventive medicine.

Vol. 34

American Journal of Public Health
and THE NATION'S HEALTH

Official Monthly Publication of the American Public Health Association

Volume 34 November, 1944 Number 11

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THE SECOND WARTIME PUBLIC HEALTH CONFERENCE

THE *Annual Meeting held in New York (October 3–5)* was again an unqualified success. The attendance (3,984) compared well with the present total membership of 9,163. The program was of high quality. President Felix J. Underwood of Mississippi guided the General Sessions and the Governing Council with the firmness and graciousness and the sure choice of words which make him admired and beloved. As President for 1944–1945, we welcome John J. Sippy of California, the first county health officer to receive this honor; and the choice of Milton J. Rosenau of North Carolina as President-Elect gives delight to all the disciples of the Dean of Public Health in the United States—that is, to all of our public workers, everywhere. The award of the *Sedgwick Memorial Medal for 1944* to Ernest W. Goodpasture was a fitting tribute to a scientist whose discoveries underlie much of our practice in the control of virus and rickettsial diseases.

As is natural in a war period, the program this year included fewer new advances in the fields of basic scientific research than has often been the case. In the field of new technics, the extraordinary possibilities offered by the use of DDT were, of course, outstanding; this material gives us methods for the destruction of many insect vectors with an efficiency that is almost unbelievable. The Army Commission on Neurotropic Diseases reported some of its studies on Infectious Hepatitis—the outstanding "new" disease of this war; and demonstrated the production of this infection in human volunteers by feeding virus derived from excretal material. The possible introduction into this country of anthropod-borne encephalitides was discussed. A group from the Michigan School of Public Health presented perhaps the most comprehensive epidemiological study of poliomyelitis ever made, revealing the overwhelming influence of contact infection (stools positive in 75 per cent of familial contacts, in 18 per cent of non-familial contacts, in 2 per cent of non-contacts). In regard to the important question whether the sterilization of air in barracks is justified in routine practice, investigators at Northwestern University (using triethylene glycol) and navy doctors (using ultra-violet radiation) reported in the affirmative; the gain effected in the second of these studies was, however, slight. Investigators from North Carolina

compared the findings from tests of subclinical malnutrition with actual family dietaries with disturbingly slight concordance of results.

It was the field of administrative practice rather than of epidemiological research which dominated the conference. The Health Officers Section opened its program with a panel discussion on local health administration which was vital and constructive. Discussion was continuously and spontaneously maintained from the floor and every speaker "made sense." To the oldsters in the A.P.H.A., the appearance each year of more and more able and informed and earnest young city and county health officers is a thrilling experience. Methodology in the control of nuisances was helpfully discussed in the Engineering Section.

Outstanding in this field were preliminary reports of Haven Emerson's Committee on Local Health Units, which will give us a framework for a really national health program, with at least minimum basic full-time service (at $1 per capita) for 1,169 well planned areas covering the entire country—instead of the present mean expenditure of $.50, with 40 per cent of our population lacking any full-time local health service. The C.A.P. program for a National Reporting Area for health practices [1] will be invaluable in connection with this—or any other—national health program.

It is clearly impossible even to refer to the 36 general and sectional sessions held in New York. The joint session at which a coöperative plan for the health education of industrial workers by the Fort Greene Industrial Health Committee (Brooklyn) aroused particularly wide interest. It is gratifying to note the progress of our two youngest sections, on School Health (organized in 1942) and on Dental Health (organized in 1943).

One of the most striking features of the Conference was its recognition of international health problems. At the first general session Raymond B. Fosdick, President of the Rockefeller Foundation, delivered the Third Annual Delta Omega Lecture on "Public Health as an International Problem," published in this issue of the JOURNAL—a splendidly effective presentation of our common responsibilities as citizens of "One World." The First Special Session, on "Today's Global Frontiers in Public Health" in which representatives from five nations participated, carried our thoughts on this line further, the address of Szeming Sze, of China being particularly impressive. An Association Committee on Pan-American health problems under the chairmanship of Louis I. Dublin is making its contribution; and the fact that our revised report on Communicable Disease Control seems likely to be adopted by at least three other nations is an example of highly practical international service. The Association by official resolution offered its assistance to UNRRA in its difficult tasks; and called for the creation of a new international health organization as a part of the future world order.

The most outstanding problem of the conference was that of medical care. For twenty years or more this topic has come up in our annual sessions; at last, in 1944, it was faced with courage and determination. Mayor Fiorello H. LaGuardia opened the ball at the second general session. With his inimitable vigor he told us "When knowledge is not applied, it's *wicked*" and that "People have a right to medical care"; and he described the program for a voluntary health insurance plan, with complete coverage, for employees of the city and of private industry which will soon go into force in New York City. A discussion before the Maternal and Child Health Section dealt with the problem of medical service for migrant workers and the excellent way in which it has been handled

by the Farm Security and War Food Administrations. A Special Session was devoted to addresses by a group of members of the Subcommittees on Medical Care of the C.A.P. (under the chairmanship of J. W. Mountin), on the content and administration of a Medical Care Program. Excellent programs of this sort have, however, been presented at previous meetings. What is significant about 1944 is that the Association at last took action. On recommendation of the C.A.P., and after full discussion at two meetings, the Governing Council formally adopted the report of Dr. Mountin's Committee on Medical Care in a National Health Program * as the official policy of the Association.

This action puts the A.P.H.A. squarely on record in favor of a national program which shall make available for all the people of the United States complete and adequate medical care of all essential types. It makes it clear that such an end can be attained only by a decentralized but federally aided program; that it must be supported by compulsory insurance plus taxation or by taxation alone; and that it should be administered by a single public health agency at the federal, state, and local levels.

This is a bold pronouncement, which required real courage to adopt. The policy outlined is sound and will, we believe, receive the very serious consideration of legislators concerned with this challenging problem. It is fitting and proper that the first clear and constructive statement of a national program of medical care to be made by any national body of experts should come from the A.P.H.A.—since the health officer represents professional knowledge on the one side and community responsibility on the other. The physician is bound by a Hippocratic oath which calls for the highest standard of service to those individual patients who call upon his skill. The health officer is the one person whose oath of office lays upon him the responsibility of planning for the health of the community as a whole. That responsibility has been assumed—with modesty, but with a compelling sense of public duty—in the adoption of the policy formulated in New York.

* With minor amendments which clarified but in no way modified its objectives.

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1. Editorial. *A.J.P.H.*, 34:1099–1102 (Oct.), 1944.

SHALL WE CONTROL VENEREAL DISEASE?

THE control of syphilis and gonorrhea is a problem which, at this moment, presents a very special challenge to the health administrator. New discoveries open up dazzling prospects of advance; but our hopes are modified by certain serious doubts and qualifications. Statistical results give evidence of tangible achievement; but our experience after the first World War raises the question whether the results of our program—though good—are good enough.

The combined incidence rate of the venereal diseases in the U. S. Army in 1943 (under 30 per 1,000 per year) was less than half the average rate for our army in the first World War. Yet, even with this relatively low rate, gonorrhea was still at the top of the list of infectious diseases in the armed forces and syphilis near the top. Reports on civilian health made to the U. S. Public Health Service, by local health authorities for the seven months of July, 1943, to January, 1944, inclusive, showed 281,537 cases of syphilis and 181,322 cases of gonorrhea, as

compared with 331,421 and 160,000 respectively for the corresponding period of the previous year, with a rate of a trifle over 4.0 per 1,000 for syphilis and about 2.5 for gonorrhea. The lower rate for 1943 as compared with 1942 is, however, obviously influenced by the absence of a large proportion of the young male population; and it is important to remember that it was *after* the first World War that a true epidemic of syphilis and gonorrhea swept over the world, affecting neutral as well as belligerent countries.

The development of new and more effective methods of treatment is a major factor on the favorable side of the ledger. Dr. George Baehr, in an address before the Committee on Tuberculosis of the State Charities Aid Association of New York, last spring, said: "The recent introduction of rapid treatment methods for early syphilis has made it possible for the first time to eliminate the disease. The five day trip technic for massive arsenotherapy, and subsequent modifications, with and without the artificial induction of fever, can cure 80 to 90 per cent of patients with early syphilis, and render them non-infectious within a week." It is true that with the use of powerful arsenicals severe toxic reactions will sometimes appear and occasionally death will result. But the 18 month procedure, in use for over thirty years, also had some untoward results; and, since less than a quarter of the patients treated by this old method completed their course, it is clear that the new modes of using arsenicals represent a very real advance. Furthermore, as the sulfa drugs followed serum in the treatment of pneumonia—so penicillin has followed rapid application of arsenicals in the treatment of syphilis. "The results of penicillin treatment are at least as good as massive arsenotherapy, and there are no toxic effects whatever. Eighty to 90 per cent of all patients with early syphilis can be rendered non-infectious and perhaps cured within a week. Sufficient time has not yet elapsed to speak positively of a cure, but the results are most encouraging." Even more dramatic in a way than these striking improvements in the treatment of syphilis is the fact that heat treatment and the use of sulfa drugs and penicillin have now made possible the prompt and effective treatment of gonorrhea; for the attitude of health officers toward this disease was—until five years ago—almost completely pessimistic.

On the other hand, the advances in the therapy of syphilis and gonorrhea create new problems for the health administrator. A certain proportion of cases of early syphilis which receive rapid arsphenamine treatment or penicillin treatment will be apparently cured without the elimination of the spirochetes and will relapse; and Koch, Mathis, and Geiger [1] found positive cultures in 32 per cent of asymptomatic cases of treated gonorrhea. Many more cases of syphilis successfully treated by modern methods will become susceptible to reinfection than was the case with older and slower procedures; therefore, it is vitally important to seek out the primary source of infection (to which such cases may be again exposed) and to discover the contacts whom they may have infected before coming for treatment.

Clearly, the use of improved treatment methods intensifies the need for that rigorous epidemiological control which will remain the basis of our public health program in this field. Syphilis and gonorrhea are not vague and intangible social plagues; they are communicable diseases, proceeding—in a given community, at a given time—from a relatively small number of foci. They can be controlled by what Dr. W. L. Munson of the New York State Department of Health once described as "sole-leather epidemiology," followed by persuaded or enforced treatment. What can be accomplished is well illustrated by the work of the Institute

for Control of Syphilis of the University of Pennsylvania Hospital. Kresge [2] reports that, of 4,861 syphilitic draft rejects followed up, 72 per cent were under treatment or were brought under treatment, at a cost of $2.13 per case.

In most communities it is the health department which must take the lead. It is the health officer who must decide whether we shall control syphilis and gonorrhea, whether the new technics at our disposal shall be used to good effect, whether we shall conquer these diseases as we have conquered diphtheria.

Dr. Baehr tells us that: "The time has come when the public health services, state and local, as well as federal, must step in and take over the problem of therapy as a routine public health measure. The establishment of Rapid Treatment Centers in many parts of the country, with the assistance of the U. S. Public Health Service and with funds made available by the Congress, is an example of what should now be done on a broader scale. Rapid treatment should be made freely available without charge to every person with early syphilis, on the one condition that he or she provide the health department with information which will enable them to bring the contacts under treatment. Rapid treatment with penicillin requires hospitalization for a week. Beds must be made available temporarily until the disease has been wiped out.

"Now, let a new broad gauge viewpoint animate the public health services and the medical profession! We must deal with syphilis as we would with plague, cholera, or any other highly communicable disease, and wipe it out by providing adequate funds and facilities for free diagnosis and treatment for all infected persons and their contacts. The control of this widespread disease which infects hundreds of thousands each year is now in our hands if we will place the responsibility for treatment wholly in the public health services and, as with other highly communicable diseases, cease worrying about infringing upon the vested interests of the private practitioner. As a practitioner of more than 35 years, I call upon the public health services to seize this new opportunity and do a complete job!"

REFERENCES

1. *V. D. Inform.*, U.S.P.H.S., Feb., 1944.
2. *V. D. Inform.*, U.S.P.H.S., June, 1944.

MORE POWER TO THE PUBLIC HEALTH SERVICE

WE have referred in an earlier issue [1] to the legislation of last spring in regard to the U. S. Public Health Service. A second and even more important law was enacted during the summer, sponsored by Representative Bulwinkle.[2]

This Act for the first time brings together in compact and orderly fashion various laws applicable to the Public Health Service which have been accumulating for more than a century and a half. Numerous statutory amendments imposing new duties and authorities, couched in different terms, and often providing new procedures without expressly repealing previous conflicting requirements have not only left gaps in the operating framework of legislation but have created serious ambiguities and inconsistencies. The new law brings together all these various provisions, reënacts those which are active and permanent, repeals those which are obsolete, eliminates inconsistencies in language and broadens powers that have been found to be too restricted.

Among the new substantive provisions, it is gratifying—in view of the great

importance of public health nursing in our present program—to note that nurses, as well as scientists in such fields as biology and zoölogy, are now made eligible for appointment to the regular commissioned corps of the Service; and that provision is made for allowances for female commissioned officers on account of actual dependents.

The authority to formulate regulations, which under previous laws was confused and illogical, is now clearly allocated to the President, the Administrator, and the Surgeon General, in accordance with the nature and importance of these regulations. Quarantine laws and regulations may now be applied specifically to civil air navigation.

The limits of appropriations for grants to the states for public health work are increased to $20,000,000 annually, of which $2,000,000 is available for direct federal expenditure in relation to such grants. A new authority is added for grants for the control of tuberculosis in the sum of $10,000,000—with a very broad definition of what such control may include.

Particularly valuable are many provisions in this bill which give the Service increased freedom of action in regard to administrative detail. Special emergency positions can be authorized by the President in time of war or other emergency; restrictions to annual allotment and quarterly payment of grants to states are replaced by a provision for allotments and payments to be made " from time to time "; there is to be freedom for emergency treatment at Service Hospitals for those not ordinarily eligible; and considerably greater flexibility in procedures for isolation and quarantine. The scope of the research program of the Service will be materially broadened.

The 78th Congress has taken time off from " politics " to produce at least one highly constructive piece of legislation.

REFERENCES

1. The U.S.P.H.S. *Editorial, A.J.P.H.*, 34, 6:656 (June), 1944.
2. Public Health Service Act; Act of July 1, 1944; Public Law 410, 78th Congress, 2d Session.

BOOKS AND REPORTS

All reviews are prepared on invitation. Unsolicited reviews cannot be accepted.

Clinical Evaluation of the Rehabilitation of the Tuberculous—*By Louis E. Siltzbach, M.D. New York: National Tuberculosis Association,* 1944. 70 pp. Illus. Price, $.50, paper; $1.50, cloth.

To be foremost in anything on this busy planet is proud achievement. That distinction must be awarded the Committee for the Care of the Jewish Tuberculous of New York City, in devising and perfecting a scheme for the discovery of tuberculosis cases, their adequate care and treatment, and restoration to social and economic usefulness. The crowning achievement has been the successful operation of a garment manufacturing plant, planned and built for the part-time and full-time employment of tuberculous men and women. There are 170 employees, accepted without regard to race, color, or creed. None but those who have attempted a rehabilitation program can fully appreciate what a difficult road has been traversed by the promoters.

Though it is said that every institution is the lengthened shadow of a man, I see here two shadows, cast by Fred M. Stein and Edward Hochhauser, respectively President and Executive Secretary of the committee.

This clinical evaluation gives the historical background, states the philosophy upon which the service is built, describes the shop and the methods employed. The statistics have been meticulously tabulated and interpreted.

The late Dr. Lawrason Brown once remarked that no physician should attempt the rôle of statistician. Dr. Siltzbach has not committed this error but has sought the aid of well known statisticians. That makes the booklet of enormous value to students of rehabilitation. It constitutes a model for those who wish to make similar surveys. Dr. Siltzbach's long connection with the program covering many years insures clinical accuracy.

The results of a quarter century should stimulate others to emulate the example of the Committee for the Care of the Jewish Tuberculous, Inc.

H. A. PATTISON

Guiding the Normal Child—*By Agatha H. Bowley, Ph.D. New York: Philosophical Society,* 1943. 174 pp. Price, $3.00.

The purpose of this book is to present a brief review of the developmental patterns from birth to adolescence. The book has been written for young teachers in training, but should be useful not only to parents but to students working in the fields of pediatrics, public health, and to others who may have responsibility for the care of children. The growth and development of the child is discussed primarily from the emotional point of view, although the relationship between physical, mental, and emotional well-being is emphasized frequently in the text. In a book of this kind, each chapter is of necessity brief and pointed, but should serve to open the way to further study which will be aided by the authoritative bibliography following each chapter.

The best chapters are those dealing with young children from infancy up to the middle years. The chapter on adolescence is all. too brief, but this

only serves to emphasize the inadequacy of our knowledge of this age group. Many of the suggestions on ways of helping children to develop good behavior patterns are of real practical value. The case histories, while they do lend color to the chapters, and are undoubtedly instructive, because of their brevity may give the student the impression that solution of obviously difficult problems of behavior are simple and come about quite easily when an adjustment is made. The English approach is slightly different from that used by many of our American authorities in this field, in that there appears to be less emphasis on scientific developmental data, and more on the interpretation of behavior. This book can be recommended for those who wish orientation in the field of emotional growth and development of children. It should be of special benefit to teachers and school nurses.

GEORGE M. WHEATLEY

Textbook of Physiology—*By W. D. Zoethout, Ph.D., and W. W. Tuttle, Ph.D. (8th ed.) St. Louis: Mosby,* 1943. 728 pp. Illus. Price, $4.75.

The new edition of the *Textbook of Physiology* brings this valuable book up to date and thus continues its usefulness to students and teachers of physiology. Like the earlier editions, it is written in a style suitable for students in colleges and normal schools who have had basic science courses but who for the first time are being introduced to an advanced scientific discipline.

The authors have deliberately avoided the production of the exhaustive type of book which most medical students demand, and have even further condensed the purely physiological content to make room for necessary background material from chemical, anatomical, and general biological fields. The first four chapters are, in fact, devoted almost exclusively to such fundamental topics. Throughout the book there is ample exposition of animal and human anatomy so that the discussions of functions are in correctly concrete terms.

The volume is noteworthy in a number of details, especially the figures in the text which number more than 300. They are almost invariably clear and to the point and many will be recognized by the more mature reader as classical illustrations from the literature of physiology. The index is excellent, and a large glossary of terms will be found useful by students. References to original papers are lacking, but a brief list of monographs and reviews is given.

ROBERT W. CLARKE

A National Health Service—*Presented by the Minister of Health, Department of Health for Scotland to Parliament by Command of His Majesty. New York: Macmillan,* 1944. 85 pp. Price, $.75.

Everybody should read *A National Health Service,* known as "A White Paper." It is an official document from the British Ministry of Health outlining the proposals of the Government in regard to medical and health services. The opening sentence of the introduction tells the story:

> The Government have announced that they intend to establish a comprehensive health service for everybody in the country. They want to ensure that in the future every man and woman and child can rely on getting all the advice and treatment and care which they may need in matters of personal health; that what they get shall be the best medical and other facilities available; that their getting these shall not depend on whether they can pay for them, or on any other factor irrelevant to the real need—the real need being to bring the country's full resources to bear upon reducing ill-health and promoting good health in all its citizens.

This is a breath-taking proposal. It is startling in its simplicity, in its com-

prehensiveness and in the confidence with which it is entered upon.

The White Paper contains 85 pages of rather small type, closely printed material. It goes into all pertinent phases of the subject, but, of course, not into much detail on any one of them. It outlines the present situation. It explains how it came to be that way. It describes, in somewhat general terms, the general administrative structure of the proposed national medical service with its important centralized responsibilities and its highly important local organization and services. It explains how hospitals fit into the picture; also general medical practitioners, and health services.

It gives some idea as to how it all is to be financed. There is to be no payment for services rendered. Everybody is to have an equal claim for a high grade of medical care. There is to be no compulsion about it, except in the matter of paying one's taxes. In a sense it proposes to substitute a national operating health service for a national health insurance plan for employed persons and in place of chaotic arrangements in regard to all not employed. Broadly speaking, the new plan is to be financed somewhat more than one-third from the national treasury, an equal amount from the local treasury, and the remainder, slightly more than one-quarter, from the social insurance funds. Much remains to be worked out, of course, as to the details of organization and of finance, but the British people, through their government, have put their hand to the plow and it is safe to say that the furrow will be turned.

It is really delightful to read this White Paper because of its simplicity, comprehensiveness, and straightforwardness. After being obliged to read or to hear all the yelling and yapping, squalling and squawking that we have been putting up with in talk about the Wagner-Murray-Dingle Bill (most of which talk shows no sign whatever of any knowledge of the Bill, still less of any serious estimate of its merits and demerits, and it has both), to turn to this British White Paper is like stepping out of an overcrowded, overheated, overnoisy room into the clear, cool atmosphere of out-of-doors.

HOMER FOLKS

Laboratory Methods of the United States Army—*By James Stevens Simmons, and Cleon J. Gentzkow. (5th ed.) Philadelphia: Lea & Febiger,* 1944. 823 pp. Price, $7.50.

In this fifth edition of the manual, the same sections of subject matter are included as were included in the previous edition. These sections are headed Clinical Pathology, Chemistry, Mycology, Bacteriology, Rickettsiae and Filterable Viruses, Protozoölogy, Helminthology, Entomology, Pathology, Special Veterinary Laboratory Methods, and Statistical Methods. In general an attempt has been made to include laboratory methods required by recent advances in medical practice and control of communicable diseases. Thus, for example, laboratory procedures incident to the control of sulfonamide and penicillin therapy are included.

If this volume had been intended to serve as a highly condensed outline of general methods used in the United States Army, these methods to be supplemented by more detailed textbooks and manuals, its purpose would have been achieved adequately. However, it is stated in the preface that the book is intended as "a manual describing practical methods for use in the medical and sanitary laboratories of the Army." It is the opinion of the reviewer that this book has not accomplished its stated objective and that this is due primarily to the fact that an attempt has been made to include far too much material in the space utilized. As a

result, most procedures are so limited in detail and explanation that only an expert on the particular subject could intelligently conduct the laboratory procedures without access to additional library facilities. As examples, the serological grouping of streptococci and the identification of members of the genus Shigella are dealt with too briefly to permit identification by the methods presented; the rapid identification of *Hemophilus influenza* in spinal fluids by direct typing and its satellite growth with staphylococci are not mentioned; the sections on entomology and mycology are too sketchy to be of any real value in practical laboratory investigation.

As a whole the text is relatively free from inaccuracies. However, a few definitions are presented which are not generally accepted; for example, the definition of *thallus*, page 365. The index is quite complete.

No doubt this manual should be included in the library of each large general diagnostic laboratory, but, in the opinion of the reviewer, it is not as valuable as a sole source of laboratory procedures as are other existing manuals. HERBERT C. BATSON

Education and Health of the Partially Seeing Child—*By Winifred Hathaway, Associate Director of the National Society for the Prevention of Blindness—Published for the National Society for the Prevention of Blindness, by Columbia University Press, New York*, 1943. 216 pp. Price, $2.50.

It is estimated that between 22,000 and 42,000 elementary grade children have visual deficiencies severe enough to classify them as partially seeing. The failure of school and health personnel to locate these children denies them their rightful share in the education they are entitled to under our democracy.

Three major problems associated with developing a plan for the education of the partially seeing child are: determining the children that should be selected, finding these children, and devising the means by which educational opportunities suited to the needs of these children can be made available. There is a mistaken notion that only children with refractive errors like myopia, hyperopia, and astigmatism need special educational facilities. The recommendation of this book is to consider: (1) children with visual acuity between 20/70 and 20/200 in the better eye after all medical and optical help has been provided; (2) children with serious, progressive eye difficulties; (3) children suffering from diseases of the eye or diseases of the body which seriously affect vision, e.g., measles; (4) children with eye operations that result in the need for readaptation of the eye or psychological readjustment; and (5) children with crossed eyes or other muscle anomalies.

These children may be located through periodic medical and psychological examinations if properly given. A recommended procedure for visual acuity as a screening process is included in the appendix of this book. Final diagnosis of visual deficiency is dependent upon the examination of an ophthalmologist.

Once these children are selected, it is important that they have careful educational and ophthalmological supervision. This calls for the development of special facilities, well prepared teachers, and access to medical health service.

It has been demonstrated that children handicapped by visual deficiencies are capable of achievement comparable to that of children with normal vision, *provided* educational facilities and procedures are adapted to meet their needs.

Public health workers—nurses, health officers, health educators—in their contacts with schools should find this book

helpful. Chapters on program planning, school health services, teacher selection and preparation, conducting and financing classes, preparing the classroom for the partially seeing child; teaching procedures, curriculum content, guidance, and community responsibility present basic information.

This book may be thought of as an authoritative and essential handbook and guide to all those with professional responsibility for the education, health and general welfare of children.

MABEL E. RUGEN

Statistical Reporting in Public Health Nursing—*By Margaret L. Shetland, R.N. New York: Guidance of Records Committee and Cost Analyses Committee of N.O.P.H.N.*, 1944. 56 pp. Price, $.50.

This handbook is a revision of the smaller handbook entitled "Suggestions for Statistical Reporting and Cost Computation in Public Health Nursing," which was compiled in 1937 by a subcommittee representing the Records Committee and Service Evaluation Committee of the National Organization for Public Health Nursing. This last revision was made with assistance from the Records Committee and the Cost Analyses Committee of the N.O.P.H.N.

The 1944 edition, like the earlier editions, deals with statistical reporting, not with case recording. In clear, concise terms the writer indicates the essential principles underlying an effective reporting system. A distinction is made between statistics that are generally considered to be essential for all agencies to collect regularly, and data that are more significant when tabulated for special studies.

Methods of collecting and using both types of data are suggested. Cases, visits, and other units of enumeration are defined in simple terms which should aid in eliminating much of the confusion that now exists in reporting public health nursing activities due to variations in interpreting terminology.

In describing the revised method of computing the average cost of the visit as recommended by the N.O.P.H.N., the writer points out that the Cost Analyses Committee is fully aware of the limitations which the present method presents in calculating the cost of public health nursing services because of the ever increasing number of activities other than visiting which the nurses are called upon to do. Various methods of cost computation based on other units of service are being devised, but they are not discussed in the handbook because they are as yet experimental.

The careful arrangement of the contents, with the inclusion of a selected list of references and a good index, make this handbook a useful reference book for individual public health nurses as well as a splendid guide for the use of official and nonofficial agencies in collecting and reporting essential data relating to all phases of public health nursing with increasing comparability.

The writer points out that, due to the many changes in programs necessary to meet wartime needs, some of the material in the handbook is tentative, and conclusive instructions on some phases of the work would be considered premature at this time. Encouragement is given to agencies for continuing work on problems relating to conformity in statistical reporting and more satisfactory computation of cost of services.

MARY D. FORBES

Plenty of People—*By Warren S. Thompson. Lancaster, Pa.: Jacques Cattell Press*, 1944. 246 pp. Price, $2.50.

This is a valuable discussion of the population problem by a leader in the field. It is neither an exhaustive nor a technical treatise. That the author

produced in 1942 in his volume entitled "Population Problems." The fifteen chapters cover such subjects as the growth of population since 1800, the birth rate, the factors in the decline of the birth rate, the death rate, war and population growth, the future population of nations, political and economic implications of differential national growth, the distribution of population, migration, effects of age changes, social and economic effects of the slower growth of populations, the biological fitness of the people, minorities and population policies, with especial reference to a population policy for the United States. Together, they provide a readable summary to orient the lay reader in the essentials of the population problem.

It is an attractive feature of this volume that it highlights the significance of population changes for human welfare. Until recently, this field had little or no interest for the American public. There seemed to be no particular need for an American population policy. Our population increased rapidly; our resources were ample and we had no quarrels with other nations. The scene has shifted, however, and population questions have become a pressing concern for intelligent people in our country. This book should help those who want to know what is happening, not only here but throughout the world, in terms of numbers of people, their relation to natural resources, changes that are going on, and how all of this affects national welfare and future relations between nations.

Professor Thompson is well qualified to discuss these problems. He has approached his task not only with the expert knowledge of the demographer but also with the matured judgment and the wise social philosophy of the trained economist and sociologist. Workers in the field of public health will find much of value in this little book and will be grateful to the author for pointing out the significance of their work in the larger field of international relations.

THOMAS D. DUBLIN

The Road to Safety Series—*By Buckley, White, Adams, Silvernale (rev. ed.). New York: American Book Company,* 1943.

A. Away We Go,	$.28
B. Happy Times,	.80
C. In Storm and Sunshine,	.84
D. In Town and Country,	.88
E. Here and There,	.92
F. Around the Year,	.96
G. On Land and Water,	1.00
H. Who Travels There?	1.04

The Road to Safety is a revised series of eight books intended to combine good reading practices with effective safety instruction. The stories have been adapted from well known books and magazines. The material is based on safety and graded from the standpoint of reading ability from preprimer to the 6th grade.

The following safety subjects are covered in each book and presented in a different form to fit the needs of each specific age group:

School Safety
Fire Prevention
Street Safety and Travel
Home Safety
Winter Safety
First Aid
Safety Out of Doors
Vacation Safety

Numerous illustrations accompany the text.

Each book is meant to be used with a corresponding Workbook: questions and answers, sentence completion, coloring pictures, matching exercises, etc., are designed to provide a more thorough understanding of the stories read and the conceptions gained.

The series also includes three Teacher's Manuals which contain bibliographies of material for story telling

and additional reading matter, dramatizations, library activities, aids in teaching phonetics and in planning safety activities, etc.

The approach to the teaching of safety throughout the series is a positive one and mostly indirect. True courage and the desire for good adventures are fostered, while fear and gruesomeness are left out. The authors have prepared the material to meet the needs of children for safety education throughout the entire nation, whether living in large cities, small towns, or rural communities. While the material is used during the reading periods, the subject matter at the same time introduces the children to safe habits and attitudes, knowledge and skills, thus combining reading practice and safety education without adding another subject to the curriculum.

In selecting the presented reading material the authors utilized their experiences gathered over a period of years in Cleveland Schools (Ohio). These were the results of studies which not only dealt with the reading needs of pupils, but also included analyses of thousands of child accident reports.

The books are not numbered according to grade, but lettered from A to H, which suggests a certain amount of flexibility as to their use for certain age groups. HERBERT J. STACK

Contagious Diseases—*By W. W. Bauer. (2nd rev. ed.) New York: Knopf,* 1944. 188 pp. Price, $2.50.

"Modern methods for the control of communicable disease and the prevention of epidemics are available and should be used to the greatest possible extent. It is only when parents understand what these measures are and how to use them that their effectiveness can be fully realized."

This statement appears as the theme which runs through Dr. Bauer's excellent little book. It is a book for intelligent parents. There is discussion of the bacteriology and immunology of the common communicable diseases in terms that the layman can understand, and there is explanation of the household and community procedures used to break the chain of transmission of disease.

Bacteriology, control procedures, home nursing, and then specific illnesses are covered in individual chapters. Much excellent information is presented; much common misinformation is corrected. Health workers can learn something about presentation of information to lay groups by reading this book. Some health departments will wish that their regulations were more in line with existing knowledge after parents in their jurisdictions have digested the book's contents.

This guide for parents is carefully written, is scientifically accurate, and is in understandable language. It will soon find a useful place for itself.

WENDELL R. AMES

Osler's Principles and Practice of Medicine—*By Henry A. Christian. (15th ed.) New York: Appleton-Century,* 1944. 1498 pp. Price, $9.50.

The tradition of this recognized textbook of medicine has been maintained in this 15th edition. This new revision, appearing within 18 months of the previous one, brings the information in the textbook up to date and includes many recent developments, particularly from the point of view of the requirements of the medical personnel of the Armed Forces. In this connection the inclusion of recommendations from the Office of the Surgeon General of the United States Army concerning diseases of military importance is extremely valuable. Particular attention has been given to the present status of tropical diseases and other diseases of importance in the military effort.

It is too easy in evaluating a work as

extensive as this to find omissions and defects, but certain of these are worth comment. Since this edition is particularly directed toward use by medical personnel of the Armed Forces, the lack of reference to homologous serum jaundice is a striking omission, and the section on war gases contains little specific information. The recommendations for immunization against diphtheria and pertussis are not in accord with modern public health practice. The indication that sulfapyridine is the drug of choice for the treatment of Friedlaender's bacillus infections should be corrected. The references to source material are more numerous in this edition than in previous ones, but still are not adequate for the needs of the practising physician.

The textbook presents the current basic facts of internal medicine in simple, readable style and in excellent format. It will provide orientation to physicians desiring to keep up to date in medicine. DAVID D. RUTSTEIN

BOOKS RECEIVED

AN INTRODUCTION TO PUBLIC HEALTH. By Harry Stoll Mustard. 2nd ed. New York: Macmillan, 1944. 283 pp. Price, $3.25.

VITAMINS AND HORMONES. ADVANCES IN RESEARCH AND APPLICATIONS. Edited by Robert S. Harris and Kenneth V. Thimann. Vol. II. New York: Academic Press, 1944. 514 pp. Price, $6.80.

VITAL STATISTICS AND PUBLIC HEALTH WORK IN THE TROPICS. By Granville Edge. Baltimore: Williams & Wilkins, 1944. 188 pp. Price, $5.00.

VITAL STATISTICS OF THE UNITED STATES, 1942. By U. S. Department of Commerce, Bureau of the Census. Part I. Place of Occurrence. Washington, Govt. Ptg. Off., 1944. 176 pp. Price, $1.25.
Part II. Place of Residence. 533 pp. Price, $2.00.

HEALTH INSTRUCTION YEARBOOK, 1944. Edited and compiled by Oliver E. Byrd. Stanford University: Stanford University Press, 1944. 354 pp. Price, $3.00.

NURSING FOR COMMUNITY HEALTH. By Theda L. Waterman. Philadelphia: Davis, 1944. 310 pp. Price, $3.50.

GYNECOLOGY AND GYNECOLOGIC NURSING. By Norman F. Miller and Virginia Bryant. Philadelphia: Saunders, 1944. 378 pp. 227 Illus. Price, $2.75.

MALARIA: ITS DIAGNOSIS, TREATMENT AND PROPHYLAXIS. By William N. Bispham. Baltimore: Williams & Wilkins, 1944. 197 pp. Price, $3.50.

THE SAFE INSTALLATION AND USE OF ABRASIVE WHEELS. Series F, Second Section (Safety), No. 9. Montreal: International Labour Office, 1944. 175 pp. Price, $1.00.

THE DRINKER AND THE DRUNKARD. Lay Supplement No. 10. 16 pp. Price, $.10. HOW ALCOHOL AFFECTS PSYCHOLOGICAL BEHAVIOR. Lay Supplement No. 11. 15 pp. Price, $.10. THE REHABILITATION OF INEBRIATES. Lay Supplement No. 12. 14 pp. Price, $.10. Prepared and issued by the Quarterly Journal of Studies on Alcohol, New Haven, Conn., 1944.

MORALE IN INDUSTRY AS SEEN BY A NEUROPSYCHIATRIST. By Meyer Brown. Chicago (135 LaSalle Street): Industrial Welfare Department, Zurich Insurance Companies, 1944. Free from publisher. 31 pp.

EMOTIONAL HYGIENE: THE ART OF UNDERSTANDING. By Camilla M. Anderson. 3rd ed. Philadelphia: Lippincott, 1943. 253 pp. Price, $2.00.

COMMUNITY SERVICES FOR VETERANS. A GUIDE FOR PLANNING AND COÖRDINATION. By National Committee on Service to Veterans. New York: National Social Work Council, 1944. 19 pp. Price, $.10.

POSTWAR PLANNING IN THE UNITED STATES, 3. An Organization Directory. New York: Twentieth Century Fund, 1944. 134 pp. Price, $1.00.

REPORT OF THE INCIDENCE OF RICKETS IN WAR-TIME. Code No. 32–195–92. By The British Paediatric Association. New York: British Information Service, 1944. 36 pp. Price, $.25.

AEROBIC, NON-SPORING, EXCRETAL BACTERIA. A Synoptical Table of Biochemical Characters arranged in terms of manipulative procedure. By Arthur Compton. Egypt: Societe de Medicine et D' Hygiene Tropicales d' Egypte, 1943. 28 pp.

A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

RAYMOND S. PATTERSON, PH.D.

When the Lines Cross—In 1909 tuberculosis stood first and diabetes sixteenth in rank among the causes of death. Today the relative standing is seventh and ninth. In some states the curves have crossed. Herein lies the text for a dozen sermons on public or private health.

ANON. Diabetes and Tuberculosis—A Comparison. Stat. Bull., Met. Life Ins. Co. 25, 6:3 (June), 1944.

Potpourri—This fast running blow-by-blow account of many comments on recent changes in the school health program, in which almost every variety of specialist and Dorothy Nyswander take part, is worth your while. Nothing significant could be said about it in this brief note.

ANON. The Changing School Health Program. Pub. Health Nurs. 36, 9:478 (Sept.), 1944.

Once It Was Constipation or Sluggish Liver—Though this is a medical paper there are two signs-of-the-times sentences in it which deserve to be preserved in the annals of public hygiene. "In the minds of the public, lack of energy tends today to mean lack of vitamins. Our experience lends no support to the theory that vitamin deficiency seriously affects the health of a large percentage of the population."

ALLAN, F. N. The Differential Diagnosis of Weakness and Fatigue. New England J. Med. 231, 12:414 (Sept. 21), 1944.

About Detergents, Bactericides and Washers—Recommended methods for restaurant dish washing are described in detail. Experience shows, says the writer, that health officials will achieve better results by persuasion than policing. Dish washers will wash with a better will if they know the reasons than if they hear threats only. Training courses are recommended.

ANDREWS, J. Methods of Sanitizing Eating and Drinking Utensils. Pub. Health Rep. 59, 34:1103 (Aug. 25), 1944.

There's Nothing Like a Snappy Title—You will discover here a lot of information about the eyes of the Okies (and others). There is one item which should be paraded before deluded believers in racial superiorities: in all ages, Negroes were found to have less defective vision than whites.

GOVER, M., and YAUKEY, J. B. Physical Impairments of Members of Low-Income Farm Families—11,490 Persons in 2,477 Farm Security Administration Borrower Families, 1940. I. Characteristics of the Examined Population. II. Defective Vision as Determined by the Snellen Test and Other Chronic Eye Conditions. Pub. Health Rep. 59, 36:1163 (Sept. 8), 1944.

Human Reclamation—To the British Isles has fallen the honor of most of the pioneer work in rehabilitation says this writer. Among the many pre-war establishments for the rehabilitation of the disabled, was Letherhead Cripple's Training College (a dreadful name if ever I saw one), but it was the war that put this human reclamation project on the map. There are three schools of thought about the subject which will interest American rehabilitators: to them I commend the paper.

GRIFFITHS, H. E. Rehabilitation. J. Roy. Inst. Pub. Health & Hyg. 7, 9:225 (Sept.), 1944.

Prophylactic Values in Sulfa Drugs—Among young men in military training camps it was found that daily

doses of 1 gram of sulfadiazine resulted in a 50–75 per cent reduction in incidence of respiratory and streptococcic infection. It appears that the reduction in rheumatic fever parallels the respiratory diseases.

HOLBROOK, W. P. The Army Air Forces Rheumatic Fever Control Program, (and) COBURN, A. F. The Prevention of Respiratory Tract Bacterial Infections. J. A. M. A. 126, 2:84 (Sept. 9), 1944.

Last Look at the Late Flu Epidemic—After reviewing the statistics, the writers conclude that the 1943–1944 winter outbreak of influenza was larger than any epidemic since 1928–1929, but caused only 8 per cent as many excess deaths as did the 1918 pandemic.

HOLLAND, D. F., and COLLINS, S. D. The Influenza Epidemic of the Winter of 1943–44. In the United States: A Preliminary Summary. Pub. Health Rep. 59, 35:1131 (Sept. 1), 1944.

A Plan That Has Started to Roll—Here's a new story of an Ohio county school health committee which approved and put into use an individual student cumulative health record and a lot of other measures to improve the school health program. Then local committees were found necessary. What the first of these did in its initial meetings is recounted. This seems to be an important paper.

KERR, L. E. Coördinating Health Education. Pub. Health Nurs. 36, 9:463 (Sept.), 1944.

And the Sanitary Facilities Were Poor, Too—In a survey of small industries in the lower East Side of New York these arresting statistics were unearthed: none of the plants with less than 250 employees had nursing services while 64 per cent of those employing more than 250 had full-time nursing care. Only 88 per cent of all plants had medical services of any kind.

KRESKY, B., and ROSENTHAL, T. A Survey of Medical and Sanitary Facilities in Small Industrial Establishments. J. Indust. Hyg. & Toxicol. 26, 6:201 (June), 1944.

Your Beetle-Browed Attention, Please!—Syphilis being the treacherous kind of disease it is, we must wait for the final answer, but penicillin now seems to be it. Penicillin has a profound effect in early syphilis on disappearance of organisms, healing of lesions, and serological reversal. In late syphilis, also, the apparent results are much too good to be entirely true.

As you must be aware by now, the object of this bibliography is to cajole, inveigle, or otherwise to seduce you to hunt out and ponder over the papers here annotated. Well, if the poor, inadequate paragraph above, sends you to these undoubted papers-of-the-month, then all the reams of good white pulp used upon this section during the past two decades may not have been totally wasted.

MAHONEY, J. F., *et al.* Penicillin Treatment of Early Syphilis, MOORE, J. E., *et al* The Treatment of Early Syphilis With Penicillin, (and) STOKES, J. H., *et al.* The Action of Penicillin in Late Syphilis. J. A. M. A. 126, 2:63 (Sept. 9), 1944.

Heresy—Concludes the writer in these words: it probably accounts for the ability of you and me to eschew with impunity such protective foods as milk and spinach, if we don't like them. It is an important phase of man's capacity to survive and thrive in all regions of the earth. The definition of "it" you will find in the title below.

MITCHELL, H. H. Adaptation to Under-Nutrition. J. Am. Dietet. A. 20, 8:511 (Sept.), 1944.

Contemporaries of "Dem Bums"—You really should read this account of the program of wide-awake industrial health committees, so I shall say nothing here that might sate your appetite for the news.

SHOSTAC, P. An Industrial Health Com-

mittee Grows in Brooklyn. Channels. 22, 1:1 (Sept.), 1944.

What about Your Department?—Arguments are marshalled here to support the thesis that a campaign to prevent malnutrition is a legitimate function of a local health department, and that the division of nutrition should act as the centralizing agency for the better nourishment of the people.

SMITH, H. H. Nutrition and Public Health. Nutrition Abstr. & Rev. 2, 9:257 (Sept.), 1944.

Bearing the Stigma of "Crack Pot"—Psychiatric examinations of selectees demonstrate an alarming amount of ill health in our communities, and makes obvious the need for comprehensive mental hygiene programs: say these competent commentators.

WAGGONER, R. W., *et al.* Psychiatric Selection of Men for the Armed Forces. J. A. M. A. 126, 4:221 (Sept. 23), 1944.

You Take Your Choice—Nontuberculous inmates of a mental hospital were vaccinated against tuberculosis and compared with a control group. The findings support the thesis that a heat-killed, tubercle bacillus vaccine has some protective value and might be used by those who are subjected to unusual risks of tuberculosis infection. To confuse the innocent bystander a companion paper reports that the vaccine used in a free population was not attended by significant results.

WELLS, C. W., *et al.* Results Obtained in Man with the Use of a Vaccine of Heat-Killed Tubercle Bacilli.. Am. J. Hyg. 40, 2:116 (Sept.), 1944.

ASSOCIATION NEWS

OFFICERS, 1944–1945

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Sedgwick Memorial Medal for 1944 Awarded to Dr. E. W. Goodpasture

THE award was made on October 3, 1944, during the Seventy-third Annual Meeting of the American Public Health Association in New York, N. Y., by Dr. C.-E. A. Winslow, Chairman of the Sedgwick Memorial Medal Committee. In presenting the medal, Dr. Winslow said:



ERNEST W. GOODPASTURE, M.D.

" One of the peculiar charms of public health lies in the breadth of its scope and the diversity of the brotherhood enlisted in its service. The Sedgwick Medal has been awarded in recent years to administrators, teachers, bacteriologists, epidemiologists. Leaders in engineering, in vital statistics, and other areas of public health will no doubt be recognized in the future.

" Tonight, as when we honored Smith and Park, Jordan and Zinsser, we crown achievements in the basic fields of laboratory research which underlie as a sure foundation all our machinery of health administration.

" Ernest William Goodpasture is a pathologist—the first representative of that field except Theobald Smith to receive the Sedgwick Medal. He was born at Clarksville, Tenn., in 1886; received his B.A. degree at Vanderbilt in 1907, and his M.D. at Johns Hopkins in 1912. He is an honorary Master



SEDGWICK MEMORIAL MEDAL

of Science (Yale) and Doctor of Science (Chicago). Dr. Goodpasture began his career in pathology at the Hopkins (1912–1915) and at the Peter Bent Brigham and Harvard (1915–1921). He obtained valuable experience as Chief of the Department of Pathology and Bacteriology at the University of the Philippines (1922) and at the Singer Memorial Research Laboratory of Pittsburgh (1922–1924). He studied as a Rockefeller fellow in Vienna in 1924–1925; and since 1925 has been Professor of Pathology at Vanderbilt.

" Dr. Goodpasture is a member of the National Academy of Sciences; and has been Research Medallist of the Southern Medical Association (1937); President of the American Society of Experimental Pathologists (1939); Vice-President of the A.A.A.S. (1940); and he received the Kober Medal of the Association of American Physicians in May of the present year.

" Dr. Goodpasture is an outstanding teacher of pathology and, through his pupils as well as through his own direct contacts, has exerted a notable influence on the teaching of this fundamental branch of medical science. He developed new methods of staining the inclusion bodies apparent in many virus diseases; and, in general, the results of his investigations on vaccinia, on poliomyelitis, on foulpox, on molluscum contagiosum, on rabies, on herpes, on influenza, have been of primary significance in revealing the secrets of our virus enemies and in making possible our defenses against their ravages.

" As one example of the influence of Goodpasture's researches we may cite his studies on mumps which (as carried forward by Enders and Cohen) make it possible to separate those who are immune to this disease from those who are susceptible in any human population and to recognize hitherto inapparent infections—points of very great practical importance in administrative control.

" Even more far-reaching in its effects has been Goodpasture's work on vaccinia in the developing chick and on the cultivation of viruses and rickettsiae in the hen's egg, which laid a cornerstone of our knowledge in regard to the cultivation of viruses. It has proved of primary importance in the preparation of vaccines against the various forms of typhus fevers and yellow fever. The Army has recently ordered 50 million eggs for the manufacture of influenza vaccine, an experiment in

global epidemiology of major significance for which Goodpasture paved the way in his laboratories at Vanderbilt.

"There could be no better example of the farflung influence of laboratory research in the field of public health. It is an episode which would have stirred the imagination of William Thompson Sedgwick, whose work on the microbiology of water and milk and ice and air laid similar laboratory foundations for administrative procedures half a century ago.

"It is a privilege for the American Public Health Association to confer its highest honor on Ernest William Goodpasture."

In accepting the award Dr. Goodpasture made the following reply:

"It is a blessing when on rare occasions personalities arise in our midst who, because of their peculiar gifts of character and accomplishment, are representative and symbolic to us of our ideals. For students and devotees of the principles and practice of public health in America, William Thompson Sedgwick was such a man. That I am permitted on this occasion to acknowledge with you his spiritual leadership is a privilege and an honor I treasure most highly.

"Although I was working in Boston at the height of his career at the Massachusetts Institute of Technology, I missed the privilege of contact with him. Nevertheless I was aware of the impact of his influence and his preëminence.

"One of the qualities such men have in high degree I believe, is the quality of vision, inspiring faith. Dr. Sedgwick was a pioneer and as a pioneer his work was not supported by a full realization of its potentialities, but by a knowledge of the needs of his time and a faith in himself, in his students, and in his methods to accomplish a revolutionary epoch in the preservation of health.

"Today we can appreciate fully the wisdom of his foresight and be witnesses ourselves to the genuineness of his prescience and the effectiveness of his labors as teacher and as investigator.

"Indeed, in a brief span of years we have built a civilization for the integrity and survival of whose structure the application of the principles and technics advocated, devised, and practised by him and by the membership of this Association are no longer merely desirable, but essential.

"In accepting this Medal, I do so with a profound respect for the objectives of the Association: to keep ever refreshed the memory of a great man and master, to disseminate his inspiration, to join honor with responsibility in the service of our people. In honoring me you would recognize also my colleagues and the innumerable contributors to the science and practice of public health everywhere.

"For them as well as for myself I will treasure it as an expression of your approval and esteem, and, with the life of Dr. Sedgwick for an example, as a perennial commission to the service of humanity."

A.P.H.A. ADOPTS STATEMENT ON MEDICAL CARE IN A NATIONAL HEALTH PROGRAM

The Governing Council of the American Public Health Association at the 73rd Annual Meeting, recently concluded in New York City, gave extended consideration to the preliminary report on a national program for medical care published in the September, 1944, *Journal,* pages 984–988.

This report subsequent to its publication came before the Committee on Administrative Practice and was recommended with some editorial changes to the Governing Council for adoption. The discussion before the Governing Council brought out the statement of those in favor of the report and those opposed, and it was held over for 48

hours to permit full consideration and the preparation of a definitive report which then passed the Governing Council by a vote of 49 in favor, 14 against.

The report as adopted will appear in the December *American Journal of Public Health.* In the meantime persons desiring copies may obtain them by application to the Executive Secretary.

MILK LABORATORY SURVEY FORMS NOW AVAILABLE FROM A.P.H.A.

For everyone interested in plate counts of milk and milk products there is now available a handy form for checking the procedures used in making Standard plate counts against those recommended in the latest (eighth) edition of *Standard Methods for the Examination of Dairy Products.* Printed on both sides of a single sheet, the form covers the essential details of apparatus, preparation, and technics, which occupy 26 pages in *Standard Methods.*

The form was originally prepared by the U. S. Public Health Service for use in surveying milk laboratories throughout the country. It was considered so valuable by the Standard Methods Committee that it has been published by the A.P.H.A. for sale and for free distribution with copies of the third reprinting of the eighth edition of *Standard Methods.* The price is $1.00 for 50 copies, $1.50 for 100 copies, or $10.00 for 1,000 copies. Sample copies may be obtained without charge.

The form should be of value to administrators in improving the work of laboratories in their jurisdiction, to the bacteriologist and the technician as a guide in their work, and to those training new workers or teaching students in bacteriology, dairying, or public health.

DEATH OF MRS. KATHERINE ANDRUS

The members and Fellows of the Association who for years have dealt with the Central Office will learn with regret of the passing on September 23 of Mrs. Katherine P. Andrus who, since 1922, has been employed by the Association as Chief Clerk, and lately as Librarian. Her many years of faithful direction of the Book Service and other Association responsibilities were recognized by the Executive Board in a recent resolution.

APPLICANTS FOR MEMBERSHIP

The following individuals have applied for membership in the Association. They have requested affiliation with the sections indicated.

Health Officers Section

Blinn A. Buell, M.D., Dept. of Health, Portsmouth, Va., Director of Health

Harold F. Dallas, M.D., 2205 Ryer Ave., New York, N. Y., Asst. Surgeon (R), U.S. P.H.S.

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Jack B. Porterfield, M.D., M.P.H., City Hall Annex, Richmond, Va., Director of Health, City Dept. of Health

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Elizabeth J. Rubenow, 61 Cleveland St., Orange, N. J., Asst. in Bacteriology, Brown Univ.

Alexander D. McClure, 20 Alberta Ave., Toronto, Ont., Can., Bacteriologist, Royal Canadian Air Force

Nathan Moskowitz, Second Service Command Lab., 90 Church St., New York, N. Y., Bacteriologist

Lt. Bernard Newman, Sn.C., Laboratory Officer, U. S. Army Hospital

Hugo W. Nilson, Ph.D., U. S. Fish and Wild-

life Service, College Park, Md., Technologist in Charge

Henry D. Piersma, Ph.D., Lederle Laboratories, Inc., Pearl River, N. Y., Director, Human Biological Div.

Lawrence W. Slanetz, Ph.D., Dept. of Bact., University of New Hampshire, Durham, N. H., Assoc. Prof. of Bacteriology and Bacteriologist

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Engineering Section

Nolan O. Anders, P. O. Box 31, Gretna, La., Sanitary Officer, State Health Dept.

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Capt. J. Harrison Quinn, Sn.C., Station Hospital, Nashville Army Air Center, Nashville. Tenn., Sanitary Officer, U. S. Army

Major Harvey R. Wilke, 108 E. Monroe Ave., Alexandria, Va., Supervisor, Water Purification Course, The Engineer School, Ft. Belvoir, Va.

Industrial Hygiene Section

Josephine DeBrincat, 320 Sherbrook St., Winnipeg, Man., Can., Public Health Supervisor and Industrial Nurse Consultant, Provincial Dept. of Health and Public Welfare

Grant S. Winn, Ph.D., Delco-Remy Div., General Motors Corp., Muncie, Ind., Director of Industrial Hygiene

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Mildred B. Barry, State Dept. of Health, Providence, R. I., Nutrition Consultant

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Paul J. Langan, State Health Dept., Charleston, W. Va., Field Epidemiologist, Bureau of Venereal Diseases

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Kenneth M. Watson, 1517 Pinemont Drive, Columbia 58, S. C., Interested Citizen
Daniel L. Wheeler, 1301 Queens Road West, Charlotte, N. C., Interested Citizen

DECEASED MEMBERS

Samuel M. Ellsworth, Boston, Mass., Elected Member 1939, Elected Fellow 1943, Engineering Section
Israel J. Kligler, Ph.D., Jerusalem, Palestine, Elected Member 1912, Charter Fellow, Laboratory Section
Lillian A. Phelps, Oneonta, N. Y., Elected Member 1943, Public Health Education Section

VISITORS FROM MEXICO AT THE NEW YORK MEETING

Among the visitors from Mexico at the 73rd Annual Meeting of the Association in New York City were Dr. Manuel Márquez Escobedo, Director of the Training Station and Health District and Assistant Professor of Tropical Medicine in the School of Public Health and Hygiene, Mexico City. With Dr. Escobedo was Dr. Felipe García Sánchez, Medical Director of the Division of Hygiene and Welfare.

JOURNALS WANTED

The A.P.H.A. headquarters has exhausted its supply of February, June, and August issues of the JOURNAL. Members who can spare any or all of these issues are requested to send them (collect) to the A.P.H.A. at 1790 Broadway, New York 19, N. Y.

EMPLOYMENT SERVICE

The Association Employment Service seeks to bring to the attention of appointing officers the names of qualified public health personnel and to act as a clearinghouse on employment. This is a service of the Association conducted without expense to the employer or employee.

From the registry of persons available, selected announcements are published from time to time. Appointing officers may obtain lists of all registrants on request.

Address all correspondence to the Employment Service, American Public Health Association, 1790 Broadway, New York 19, N. Y.

POSITIONS AVAILABLE

STATE OF WASHINGTON DEPARTMENT OF HEALTH ANNOUNCES THE FOLLOWING OPENINGS:

Physician as obstetric consultant in Washington State Department of Health. Preferably with 3 years' special residency in obstetrics and gynecology. Salary $5,280 to $6,000 per annum.

Sanitarian. Preferably with public health training and experience. Salary $2,290 to $2,640.

Bacteriologist to take complete charge of local health laboratory. Requirements include college graduation with major in bacteriology and at least one year of employment in a public health laboratory. Salary $190 to $220 per month.

Physician as health officer in county health department in Northwest. Previous public health experience preferable. Entrance salary $440 per month. Permanent position.

Address Lee Powers, M.D., State Director of Health, 1412 Smith Tower, Seattle, Wash.

Wanted: County Public Health Nurse for midwestern state. Present salary $160 per month and travel allowance. Must have had previous experience in public health. Own and drive car. Address District Health Unit 2, West Branch, Mich.

Physician—public health pediatrics. To assist director of maternal and child health in a large California County Health Department. Major duties, conducting of infant and preschool health conferences and school examinations. Beginning salary $390 a month and travel allowance. California license required. Training and experience in pediatrics or public health or both. Immediately available. Address William C. Buss, M.D., Kern County Health Dept., Bakersfield, Calif.

Wanted: Physician with tuberculosis training to direct Tuberculosis Division of Milwaukee Health Dept. Salary $4,200 per year plus cost of living wage adjustment. If interested contact Dr. G. F. Burgardt, Milwaukee Health Dept., Milwaukee, Wis.

Southern Wisconsin county announces position now open for supervising public health nurse. Office is located in city containing state capitol and university. Staff consists of two nurses. Requirements are degree of bachelor of science in public health nursing, 2 or 3 years' experience as staff nurse, some experience as supervising nurse. Must be eligible for certification as public health nurse in Wisconsin. Beginning salary $185. Write Box Z, Employment Service, A.P.H.A.

Wanted: Physician in eastern city of 190,000 population as Director of Bureau of Maternal & Child Hygiene. Salary $4,500–$5,031 plus cost of living adjustment. Box U, Employment Service, A.P.H.A.

Wanted: Two full-time public health nurses. Salary to start $165 plus $15 War Bonus per month. Car mileage paid at rate of 5¢ per mile. Write Box Q, Employment Service, A.P.H.A.

Wanted: Superintendent and Medical Director for tuberculosis sanatorium having 65 bed capacity and average of 35 patients per day. Salary $4,380 with $300 annual allowance for car. Write M. P. Hunter, City Manager, Roanoke, Va.

Wanted: Industrial hygienist to conduct surveys of industrial plants for large insurance company with complete laboratory facilities and field testing equipment. This is an excellent opportunity for a permanent, not a war period, position. State age, family status, education, experience, qualifications, and minimum salary. Write Box O, Employment Service, A.P.H.A.

Wanted: Staff nurses for 200 bed municipal tuberculosis hospital. Salary $190 per month, $35 per month deduction if maintenance desired. Educational program with opportunity for post-graduate work with University credit

planned. For full information write Superintendent of Nurses, Firland Sanatorium, Richmond Highlands, Wash.

Wanted: Health officer for County-City health unit. Good opportunity for right man. Salary to start $4,500 per year and travel expenses. Position permanent. Address G. F. Campana, M.D., Acting State Health Officer, Bismarck, N. D.

Wanted: Assistant bacteriologist needed for modern public health laboratory in southeastern city of 70,000 population. Available salary of $1,800 increasing to $2,000 if satisfactory service shown. Write **Box N,** Employment Service, A.P.H.A.

Wanted: School dentist to direct and operate school dental program in southeastern city of 70,000 population. Salary starting $3,600 and increasing to $4,000 for satisfactory service. Write **Box Y,** Employment Service, A.P.H.A.

Wanted: Health Educator, preferably unmarried man with experience in venereal disease control. Work chiefly in suburban areas. Some evening work. Good salary with very generous travel allowance. Position under Civil Service with annual increases in salary. Address Venereal Disease Division, Wayne County Health Dept., 5716 Schaefer Rd., Dearborn, Mich.

Wanted: Public health nurse for staff work on a generalized program. Private agency, 45 hour week. Location 30 miles from New York City. Salary first year, $1,859.54; second year, $2,009.54; maximum salary $2,217.60. Transportation supplied, 24 working days' vacation annually. Write **Box V,** Employment Service, A.P.H.A.

Wanted: Director of Maternal and Child Health for Santa Barbara County Health Department. Salary $4,500 per year, all expenses furnished. Write Dr. L. C. Newton Wayland, Santa Barbara Co. Health Dept., Santa Barbara, Calif.

Wanted: Bacteriologist to take full charge of New Jersey Municipal Health Department Laboratory in community of approximately 40,000. Must be qualified to carry out all procedures of clinical, food, and sanitary bacteriology. Salary $1,980–$2,400 per year. Permanent appointment subject to civil service examination. Write **Box L,** Employment Service, A.P.H.A.

Wanted: Assistant in Health Division Council of Social Agencies, interested in community organization and health education. Large city and metropolitan area. State age, training and experience. Write **Box X,** Employment Service, A.P.H.A.

Wanted: Bacteriologist, preferably with public health laboratory experience, to supervise milk and ice cream plant laboratory. Must be familiar with dairy chemistry. Good opportunity for advancement and remuneration. Salary range from $160 monthly. Write W. H. Krehl, P. O. Box 4217, Jacksonville 1, Fla., stating education, training and references.

Michigan announces several desirable openings in positions for health directors in county, district, and city health departments. Salary ranges from $3,000 to $6,000 with travel allowances. Write Director, Bureau of Local Health Services, Michigan Department of Health, Lansing 4, Mich.

New Mexico Department of Public Health offers unusual opportunities for employment. Positions: Director of Maternal and Child Health, Director of Public Health Nursing, Public Health Nursing Consultant, Public Health Nurse-Midwife Consultant, Public Health Nurse-Midwife, Public Health Nurse, Emergency War Nurse and Field Nutritionist. Salary ranges $135 to $500. Also, Senior Bacteriologist-Serologist, Emergency War Bacteriologist-Serologist, Supervisor of Laboratory Maintenance, Senior Assistant Bacteriologist-Serologist, Emergency War Assistant Bacteriologist-Serologist, Junior Bacteriologist-Serologist. Salary ranges $115 to $225. Closing date for applications November 30, 1944. For application blanks and information write New Mexico Merit System, Box 939, Santa Fe, N. M.

Wanted: Assistant health officer. Must be able to diagnose communicable diseases, conduct well baby conferences, give immunizations, etc., in adequately financed health department. Salary $325 per month plus mileage. Write **Box R,** Employment Service, A.P.H.A.

Wanted: Experienced, aggressive sanitary engineer for well organized county health deparment in Michigan. Salary $3,000 and travelling expense. Write **Box S,** Employment Service, A.P.H.A.

FOR OTHER POSITIONS AVAILABLE WRITE EMPLOYMENT SERVICE, AMERICAN PUBLIC HEALTH ASSOCIATION, 1790 BROADWAY, NEW YORK 19, N. Y.

In view of the current active demand for trained and experienced persons in public health, it is suggested that prospective employers communicate directly with the Employment Service, American Public Health Association, 1790 Broadway, New York 19, N. Y., for up-to-date lists of applicants.

POSITIONS WANTED

ADMINISTRATIVE

Physician, age 56, with 16 years' uninterrupted experience as county health officer, desires position in public health work, preferably southern. Licensed in So. Carolina and Maryland. Best of references. **A-512.**

ENGINEER

Well qualified public health engineer seeks responsible position in New York metropolitan area. **E-480**

Sanitary Engineer, C.E. 22 years' experience as sanitary engineer, 14 as director in state health department, now employed. Desires change. Location immaterial. **E-481**

HEALTH EDUCATION

Woman with background of nursing administration and health education seeks position in health education field. **H-509**

Man, **Ph.D. in health education,** with 20 years' successful experience in large school of nursing in Metropolitan New York area seeks additional affiliation in same area. **H-510.**

LABORATORY

Research bacteriologist - veterinarian, now in civil service, desires change to direct or indirect war work. P-3 classification. Considerable laboratory and field experience. Used to foreign travel; will go anywhere. Steady hard worker. **L-470**

Bacteriologist-biologist, experienced in antibiotics, sulfonamides, food, water, pharmaceutical and public health problems. Equipped to conduct research, test and develop new products. Desires placement in New York area. **L-471.**

STATISTICS

Woman with background of statistics and epidemiology involving administration seeks position in statistical administration. Salary $3,500 or over. **S-460**

MISCELLANEOUS

Sanitarian-Veterinarian, age 23, seeks employment in public health field. Experienced as veterinarian, serologist, sanitary inspection. **M-460**

Advertisement

Opportunities Available

WANTED—(a) Public health physician to direct department of health, public school system; enrollment of 25,000; 800 employees; well staffed department including assistant physicians, dentist, nurses, technicians, etc. (b) Public health physician to head state service; duties including directing crippled children's program, adult physical rehabilitation program; South; salary $5,000 plus traveling expenses and subsistence when in the field. (c) Public health physician to head department in city of 65,000; staff of 12; possibility of combining city and county units; West. (d) Director, student health department; duties consist of charge of 50 bed infirmary and responsibility of health service to 1,700 civilian students and 300 army trainees; no surgery; Pacific Coast; $5,000–$6,000. (e) Student health appointment; young women's college; approximately 2,000 students; new, well equipped infirmary, large dispensary; staff of five physicians; nine graduate nurses; East. (f) Physician to operate municipal health clinic for treatment of syphilis; duties include conducting prenatal and well-baby clinics; South. (g) Associate professors or instructors in public health and industrial medicine; university medical school; Middle West. **PH–10–1**, The Medical Bureau (M. Burneice Larson, Director), Palmolive Building, Chicago, Illinois.

WANTED—(a) Director of public health nursing; duties consist of supervisory and administrative work; New York. (b) School nurse, to direct health service in large high school; duties include teaching periods in Home Nursing and Health; Middle West. (c) School nurse; to supervise staff of seven nurses; public schools, town of 75,000 located short distances from several large cities; will have school assignment of own; year-round appointment. (d) Industrial health counselor; organization having approximately 3,000 employees; duties would consist of investigating illnesses causing absenteeism, serving as counselor, and directing student health program generally; B.S. degree in social sciences advantageous, or training in public health nursing, candidate without degree eligible, however, salary in accordance. (e) Several industrial nurses; newly-created medical department, large industrial company; excellent opportunities for advancement; $300. (f) Public health nurse to supervise corps of public health nurses; new program; interesting project. (g) School nurses; public health certificates required; cars unnecessary but advantageous; generalized program; large city, Pacific Northwest. (h) College nurse; East. **PH–10–2**, The Medical Bureau (M. Burneice Larson, Director), Palmolive Building, Chicago, Ill.

Situation Wanted

DENTIST recently retired as lieutenant colonel from dental corps of armed forces is available; D.D.S., A.B., and M.S. from leading schools; experience includes several years as chief of dental service, large institution, and twelve years' private practice limited to diagnosis and oral surgery; some teaching experience. **PH–10–3**, The Medical Bureau (M. Burneice Larson, Director), Palmolive Building, Chicago, Ill.

NEWS FROM THE FIELD

A SUGGESTED "KEEP FIT" PROGRAM

The Joint Committee on Physical Fitness of the National Committee on Physical Fitness of the American Medical Association has requested the JOURNAL to reprint the attached suggested "Keep Fit" program for schools and colleges of America. Colonel Leonard G. Rowntree, MC, AUS, is Chairman of the Joint Committee which functions under the Federal Security Agency, Washington.

The schools and colleges of America have contributed greatly to the health and fitness of young Americans, but even greater effort is needed if their contribution is to attain a level commensurate with their opportunities and responsibilities to their pupils and their communities.

The following recommendations are proposed to help schools and colleges to define more clearly their responsibilities and to help them to attain these goals:

I. It is recommended that the following objectives be proposed to schools as minimum requirements of their programs in health and physical education—

1. Thorough physical examination of all children (a) on or before admission to school and at such regular intervals thereafter as may be deemed advisable; (b) on readmission to school following any major illness; (c) on teacher referral when the pupil's appearance, performance, or routine screening test records suggest failing health or defects. Whenever possible the parent or teacher should attend the examination of younger children.
2. Daily *teacher inspection of all pupils* for signs of deviation from normal health status.
3. Routine screening tests to discover defects of vision and hearing and failure to grow.
4. At least annual, preferably semiannual, dental attention for every pupil.
5. An annual inventory of the physical abilities of every pupil by teachers of physical education.
6. Suitable follow-up work to assure (a) the correction of correctible defects and the prevention of preventable conditions, and (b) the assignment of pupils to modified activities programs where this is needed.
7. The use of a cumulative record blank designed to follow the child throughout its school life and to record (a) the results of physical examinations, screening tests, and physical fitness inventories, and (b) the dates of major illnesses, immunizations, dental visits, and corrective measures taken.
8. Organized health instruction on all school levels and planned healthful living throughout the school experience. At elementary levels this may be undertaken as a part of larger projects. At secondary levels there is need, in addition, for instruction specifically devoted to this area. This should not be as a "rainy day" substitute for or otherwise at the expense of physical education. Irrespective of title or departmental affiliation such instruction must develop accurate knowledge, appropriate attitudes, and sound habits aimed to further individual and community health. This demands at least a semester course of organized health instruction on the junior high school level and a semester or year course on the senior high school level, equivalent in length and regulations to other standard courses, to be required of all students. These courses should be taught by adequately prepared teachers and for a requirement for graduation.
9. At the elementary level at least 40 minutes daily, exclusive of recess periods, devoted to planned physical education activities suited to the grade level involved.
10. At the secondary level (grades 7 to 12) a daily period of vigorous physical education. This period should be at least as long as the regulation class period, and be scheduled within the

school day. Pupils should be classified in respect to sex and grade, ability or special needs. Standards should be set for passing the course in all grades, and acceptable performance required for promotion and graduation.

11. Expert supervision and direction at local and state levels as for other fields. In some instances the training of a person may qualify him to supervise both health and physical education.
12. The strengthening and extending of advisory and consultative services of the U. S. Office of Education in these areas.

Further school efforts to improve the physical fitness of youth could wisely be directed toward (1) extension of health inventory and correction of defects in the preschool years; (2) insuring sound mental health; (3) improvement of child nutrition through the provision of adequate school lunches; (4) provision of camping and other extended school services contributing to health; (5) systematic coöperation with all community health efforts such as tuberculosis case finding, venereal disease control, and maternal and child health clinics.

II. It is recommended that teacher training institutions be urged to include in their program for training teachers, instruction and practice in the daily observation of children for the purposes of detecting signs indicating possible deviations from normal health and development.

III. It is recommended that professional training institutions be urged to revise if necessary their programs for the training of teachers of health and physical education and of recreation leaders to give special consideration to promotion of health and physical fitness.

IV. It is recommended that teacher training institutions be urged to give some training in the conduct of physical fitness activities to all prospective teachers.

V. It is recommended that plans be perfected for giving special consideration to post-war planning of school facilities toward better provision for coördinated school and community health and physical education programs and for extended community use of school facilities.

ARMY TO USE INFLUENZA VACCINE

According to a recent announcement of the War Department, plans are under way for a vaccine to combat the spread of influenza should the disease occur in epidemic form. The Commission on Influenza under the Army Epidemiological Board, has stated that the vaccine will not be administered routinely but will be given only on definite indication of the threat of influenza and only to personnel under risk of exposure to the disease. The Commission on Influenza, of which Dr. Thomas Francis, Jr., Professor of Epidemiology at the University of Michigan School of Public Health, is the director, carried out in 1943 a control clinical trial of the prophylactic efficacy against epidemic influenza of a concentrated vaccine containing the killed influenza viruses Types A and B. In coöperation with a number of civilian and military agencies an extensive investigation was carried out showing that there was a reduction of about 75 per cent in the incidence of influenza among the vaccinated as compared with the unvaccinated controls. It was also established that the illness of vaccinated persons was milder and shorter. The vaccine which was used was developed by Dr. Francis and Dr. Jonas E. Salk and their associates.

EFFECTIVENESS OF ULTRA-VIOLET DISINFECTING LAMPS IN SCHOOLS

A report has recently been released by the Joint Committee on Health Problems in Education of the National Education Association and the American Medical Association bearing on the question as to whether the installation of ultra-violet lamps in schoolrooms for sterilization of the air is warranted. According to this report, the Council on Physical Therapy of the American Medical Association does not accept ultra-violet lamps for which claims are made that they will prevent cross-infection in schoolrooms or will disin-

fect solids. This Council acceptance of ultra-violet disinfecting lamps is limited to installations in hospital nurseries, hospital wards, and operating rooms.

". . . satisfactory evidence is not available to warrant acceptance of ultra-violet lamps for disinfecting solids. To kill a microörganism a direct hit by ultra-violet rays of sufficient intensity is required. This is difficult to accomplish on the edge of a drinking cup, for example, also in a liquid containing suspended matter or in air laden with dust particles that shield the organism. Ultra-violet radiation cannot penetrate deeply and hence may be absorbed by finger marks, saliva, cosmetics, or other foreign matter on a drinking cup. In view of the present available evidence, ultra-violet radiation appears to be an uncertain means of sterilizing solid objects (drinking cups, combs, brushes, shaving utensils, toilet seats, and shoes) even if irradiation of the whole surface is possible. Ultra-violet lamps are not accepted for disinfecting air in schools, waiting rooms, public gathering places, and large halls. The evidence now available does not indicate that the incidence of colds can be reduced by the installation of ultra-violet lamps and by the irradiation of an enclosure occupied by people.

"It must be remembered that injurious physiologic effects may arise from prolonged ultra-violet irradiation of a person. Overdoses of ultra-violet rays will produce conjunctivitis and a serious erythema. Since the occupants of the room must be shielded from the rays, the space containing the highest concentration of infectious microörganisms is not irradiated. Those droplets laden with bacteria and emitted by the infected person are distributed so that they are freely inhaled by a recipient long before the natural or artificial flow of air will carry the droplets to the irradiated spaces. It follows, therefore, that disinfecting lamps are of little or no value in preventing cross-infection in schoolrooms."

USING RESULTS OF HEALTH EVALUATION

The Birmingham-Jefferson County Public Health Committee of the Birmingham Chamber of Commerce (Alabama) has demonstrated how to use the results of a health evaluation effectively. Following the submission of a schedule to the American Public Health Association for the National Health Honor Roll, a most attractive eight page pamphlet has been issued which reproduces the critical comments from the American Public Health Association in interpreting the local schedule. The Health Officer, Dr. George A. Denison, writes to the American Public Health Association:

"The 1943 evaluation study has been most helpful to this department, both in pointing out weaknesses and need for strengthening certain fields and in developing better public relations and understanding."

But better yet the Health Committee includes in the pamphlet what has been done in correcting weak situations and what is going to be done in the future. There is every indication that Birmingham and Jefferson County are serious about public health protection and mean to build a strong program.

ADVERTISING AGENCY SURVEYS COLDS

Dr. Travis P. Burroughs, Health Officer of Portland, Me., reports that information has been solicited by telephone and personal visit from the residents of Portland who were asked to supply the record of recent colds to the "Public Health Survey Research Department."

According to Dr. Burroughs, this survey is under the auspices of Morse International, Inc., Advertising, 122 East 42nd Street, New York, N. Y., of which M. F. House is President. The solicitors are alleged to claim representing the Health Department in soliciting the information.

THE AMERICAN CANCER SOCIETY, INCORPORATED

Announcement has been made by the American Society for the Control of Cancer, Incorporated, New York, N. Y., that the name of this organization is now changed to the American Cancer Society, Inc. In the future the society's lay organization, the Women's Field Army, will be known as the Field Army, and men as well as women will

be identified with this work. J. Louis Neff has become Executive Director, and George B. Larson, formerly assistant secretary of the Wisconsin State Medical Society, Madison, has become director of publicity and public relations. According to the society's announcement, the society plans to expand and to extend its efforts not only to educate the public but to obtain from the public funds for cancer research, diagnosis, treatment and education.

AMERICAN RED CROSS APPOINTS MEDICAL COMMITTEE

Basil O'Connor, Chairman of the Central Committee, American Red Cross, has announced the appointment of a Special Medical and Health Committee to survey current Red Cross operations of a medical and health character and to recommend plans for the post-war period. On the committee the following members have been appointed:

Dr. Lewis H. Weed, *Chairman,* Washington, D. C., Division of Medical Sciences, National Research Council
Dr. Felix J. Underwood, *Vice Chairman,* Jackson, Miss.
Dr. George Baehr, New York, Director of Clinical Research. Mt. Sinai Hospital
Dr. Wilburt C. Davison, Durham, N. C., Dean and Professor of Pediatrics, Duke University, School of Medicine
Dr. Morris Fishbein, Chicago, Editor *Journal of the American Medical Association*
Dr. Alan Gregg, New York, Director of Medical Sciences, Rockefeller Foundation
Major Gen. Norman T. Kirk, Washington, D. C., Surgeon General, U. S. Army
Dr. Frank H. Lahey, Boston, Lahey Clinic
Dr. Roger I. Lee, Boston, President elect, American Medical Association
Vice Admiral Ross T. McIntire, Washington, D. C., Surgeon General U. S. Navy
Dr. Thomas Parran, Washington, D. C., Surgeon General U. S. Public Health Service

Dr. Henry R. Viets, Boston, will act as Secretary of the committee.

In announcing the committee, Mr. O'Connor said:

Medical and health problems touch virtually every aspect of Red Cross activities, whether in terms of disaster relief, nursing, accident prevention, nutrition, or blood donations. Because of this vital relationship to the general Red Cross program, I have asked 11 prominent medical and health experts to serve as a special committee to survey what we are doing currently, analyze the results achieved, and give me a blueprint of possible Red Cross Activities in these fields in the post-war period. The group appointed was chosen because of their familiarity with operations of the American Red Cross in the medical and health fields.

PERSONALS

Central States

WILLIAM A. CORCORAN, M.D., has been appointed Health Officer of Ishpeming, Mich., succeeding NEAL J. MCCANN, M.D.

DOUGLAS S. FRYER, M.D., D.P.H.,† resigned August 11 as Assistant Director of the Bureau of Local Health Services, Michigan Department of Health, Lansing, Mich., to join the Wyeth Laboratories, Philadelphia, Pa.

E. C. ROSENOW, M.D.,† who since July 1, 1944, has been Emeritus Professor of Experimental Bacteriology, Mayo Foundation, Graduate School, University of Minnesota, has accepted an invitation to join the California Institute of Technology, Pasadena, where he will continue his research.

Eastern States

DONALD W. CRITTENDEN, M.D., Mansfield, Pa., has been awarded the first Fellowship in Industrial Medicine at the School of Medicine, University of Pittsburgh, according to an announcement by Dr. T. Lyle Hazlett, Medical Director of the Westinghouse Electric and Manufacturing Company, Pittsburgh. The Fellowship

* Fellow A.P.H.A.
† Member A.P.H.A.

has been made possible through a grant from the James S. Kemper Foundation of Chicago.

H. JACKSON DAVIS, M.D., DR.P.H.,* Chief Medical Officer of the State Department of Social Welfare, Abany, N. Y., has been granted leave of absence to accept a commission as Major in the Civil Public Health Division, U. S. Army Medical Corps, which is developing public health policies and practices in liberated and occupied countries.

GUSTAV J. MARTIN, Sc.D., has been appointed Research Director of the National Drug Company, Philadelphia, Pa.; he has been Assistant Director in Charge of the Division of Chemistry for the Warner Institute for Therapeutic Research, New York, N. Y.

Southern States

LAMAR A. BYERS, M.D., Jackson, Tenn., has been appointed Health Officer of Coos County, Ore., with headquarters in Coquille.

LYNN M. GARNER, M.D., M.P.H.,† District Health Officer, Higginsville, Mo., was appointed Director of the Division of Maternal & Child Health of the State Board of Health of Missouri, Jefferson City, Mo.

FRANK M. HALL, M.D., has resigned as Director of the Limestone County Health Unit, Athens, Ala., to organize a similar unit in Gainesville, Fla.

MILLARD C. HANSON, M.D., DR.P.H.,* has resigned as City Health Director of Richmond, Va., and has been appointed Medical Director for the American Red Cross in charge of the Pacific Area office, San Francisco. Dr. Hanson's territory will include 7 western states and Alaska.

LOVE E. PENNINGTON, M.D., Superintendent of the Milledgeville, Ga., State Hospital, has been appointed to a similar position at the Madison State Hospital, North Madison, Ind.

HERBERT P. RAMSEY, M.D., Washington, D. C., has been appointed Chairman of the Health Division of the Washington Council of Social Agencies.

HENRY W. TOBIAS, M.D., for more than 6 years Chief Medical Officer of the Veterans Administration Facility, Columbia, S. C., has resigned.

WILLIAM J. WALTER, M.D., Pikeville, Ky., has been appointed Director of the Pike County Health Department.

FRED J. WAMPLER, M.D., DR.P.H.,* Professor of Preventive Medicine at the Medical College of Virginia, Richmond, Va., has resigned to accept a position as Medical Director with the Rustless Iron & Steel Corporation, Baltimore, Md., effective October 1.

Western States

THOMAS H. BIGGS, M.D., has been appointed Health Officer of Kelso, Wash., in addition to his work as Health Officer of Cowlitz County.

JOHN H. FOUNTAIN, M.D., M.P.H., has been appointed Medical Director of the Morningside Tuberculosis Hospital, King County, Wash. Dr. Fountain is a graduate of Georgetown University in medicine and of the Harvard School of Public Health. He has served recently as Health Officer of Weld County, Colo., and as Health Officer of Denver.

EMIL E. PALMQUIST, M.D.,† Seattle, Wash., Health Officer of King County, has been elected President of the Washington State Social Hygiene Association.

Foreign

JOSEPH S. MAXWELL, M.D., formerly missionary to Ethiopia, has been appointed physician at Wheaton College, Ill.

* Fellow A.P.H.A.
† Member A.P.H.A.

Deaths

PROFESSOR ISRAEL JACOB KLIGLER,* occupant of the Jacob Epstein Chair of Bacteriology and Hygiene at Hebrew University, Palestine, since 1926, died on September 23.

MARY MCCORMICK, R.N., of the State Department of Health, Albany, N. Y., died on September 2.

SENIOR SURGEON LIEUEN M. ROGERS, M.D., of the U. S. Public Health Service, Fort Worth, Tex., died of a heart attack on September 7.

* Fellow A.P.H.A.
† Member A.P.H.A.

CONFERENCES AND DATES

American Society of Heating and Ventilating Engineers—51st Annual Meeting. Hotel Statler, Boston, Mass. January 22–24, 1945.

American Water Works Association—
New Jersey Section—Hotel Madison, Atlantic City, N. J. November 2–4.
Four States Section—Benjamin Franklin Hotel, Philadelphia, Pa. November 8–10.
Virginia Section—John Marshall Hotel, Richmond. November 14–15.
South Dakota Water and Sewage Works Conference. Lincoln Hotel, Watertown, S. D. November 14–15.
Florida Section—Suwanee Hotel, St. Petersburg, Fla. November 16–18.
New York Section—Mid-winter Luncheon Meeting, Pennsylvania Hotel, New York, N. Y. January 17, 1945.

Annual Seminar on Reading Disabilities. Pennsylvania State College, State College, Pa. January 29–February 2, 1945.

Association of Military Surgeons of the United States. Hotel Pennsylvania, New York, N. Y. November 2–4.

Civil Service Assembly—Conference on Public Personnel Administration. Chicago, Ill. November 1–3.

Florida Public Health Association. Gainesville, Fla. December 4–6.

Institute of Medicine of Chicago—Postgraduate Assembly on Nervous and Mental Diseases and War. Palmer House, Chicago, Ill. November 1–2.

Michigan Public Health Association. Grand Rapids, Mich. November 1–3.

National Chemical Exposition—Sponsored by the Chicago Section of the American Chemical Society. The Coliseum, Chicago, Ill. November 15–19.

National Committee for Mental Hygiene—35th Annual Meeting. Hotel Pennsylvania, New York, N. Y. November 8–9.

New Mexico Public Health Association. Santa Fe, N. M. November 8–11.

New York State Association of Public Health Laboratories — Midyear Meeting. State Laboratory, Albany, N. Y. November 17.

U. S. Public Health Service—National Conference on Post-war Venereal Disease Control. St. Louis, Mo. November 9–11.



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American Journal of Public Health
and THE NATION'S HEALTH

Volume 34 December, 1944 Number 12

Content and Administration of a Medical Care Program

A Brief of the Report on Medical Care in a National Health Program *

JOSEPH W. MOUNTIN, M.D., F.A.P.H.A.

Assistant Surgeon General, U. S. Public Health Service, Washington, D. C.

BEFORE a professional body such as the American Public Health Association, there is little purpose in belaboring the point that the great unsolved problem in public health is one of making available to every American citizen the full benefits of good medical care. The very fact that this problem has already taken on the status of a political issue is a more convincing indication of its importance than any argument or body of statistics that could be adduced. The intemperate support of limited remedial measures by partisan groups, as well as the blind opposition to any change in the *status quo* encountered from other sources, clearly indicate the need for responsible agencies to give technical direction to the public movement for better medical care. The American Public Health Association should be peculiarly fitted to give such direction, since its members are familiar with the intimate character of medical service and can see the problem from the point of view of both those who receive and those who provide health services.

Mindful of the urgency in this matter, the Committee on Administrative Practice at its meeting in November, 1943, directed its Subcommittee on Medical Care to draft a set of principles which would describe the content of a suitable medical care program and methods of administration. Inasmuch as a great wealth of material had already been accumulated through basic studies and as a result of practical experience in the operation of limited medical care programs, it was decided that the first job for the subcommittee to undertake should be to analyze these findings rather than engage on additional research studies. The subcommittee was fortunate in having as members individuals who had participated in former studies, others who

* Presented before the American Public Health Association at the Seventy-third Annual Meeting in New York, N. Y., October 4, 1944.

were familiar with the experience gained in various organized methods for distributing medical care, and still others responsible for medical care programs now in operation—in brief, its composition included both students of the problem and practical administrators.

The subcommittee met several times during the past twelve months. After exploring in detail many of the problems involved in the design of a national medical care program, the group felt that its thinking had reached the stage at which a statement of principles could be formulated. A preliminary report setting forth these principles has been released. It was published in the September, 1944, issue of the *American Journal of Public Health,* with the thought that the entire membership of the Association might have ample opportunity to study the proposals in advance of formal action. After some modification, this report was accepted by the Committee on Administrative Practice and passed on to the Governing Council with suggestion that it be considered as an expression of Association policy. There follows a brief summary of the report, together with a few of the underlying considerations.

The objective of a national medical care program should be to make available to the entire population, regardless of the financial means of the individual, the family, or the community, all essential medical services. Such services must be of high standard and rendered under conditions acceptable to the public and the professions concerned. In scope they should include hospital care, the services of physicians, laboratory and diagnostic services, nursing care, essential dental services, and prescribed drugs. Because of inadequacies of personnel and facilities, all of these measures cannot be provided immediately to the whole population, but their complete development within ten years may be taken as a goal. Regardless of temporary shortcomings, a beginning should be made now in the provision of services to the extent that available personnel, facilities, and administrative technics make possible. Later, but as rapidly as possible, the program should be expanded to the intended scope.

An achievement of the objectives of a national medical care program, the subcommittee thought, would require simultaneous attack on five main fronts; namely, distribution of costs, development of administrative organization to provide the service, training of personnel, construction of facilities, and improvement of knowledge.

The basic problem in providing more and better medical care for persons of all circumstances is that of distributing costs over the entire population in proportion to ability to pay. Already the phenomenal success of non-profit voluntary insurance against hospitalization costs makes it quite apparent that the people desire a convenient way of paying for medical care, and especially a way that will give protection against the risk of heavy bills. Despite such achievements, there is ample reason for believing that voluntary insurance unaided will not be able to include the whole population for all of its medical needs.

The subcommittee therefore came to the conclusion that health services must be financed by compulsory social insurance contributions supplemented by general taxation, or by general taxation alone. Financing through social insurance contribution alone might result in the exclusion of farmers or self-employed persons, or still other occupational groups, who need the advantages of prepayment as much as industrial and commercial employees. Certain of the long-term disabling conditions, such as mental disorders and tuberculosis, had better be financed for the present at least, as

they now are, out of general revenue separate from the provisions for general illness.

The subcommittee was unwilling to compromise the principle that service should be of high quality and available to all persons regardless of economic circumstances or geographic location. It also recognized the desirability of decentralized operation, with participation by state and local authorities. Because of the great mobility of our population and the wide variation in economic resources among the several states and their political subdivisions, an unrelated series of state or local plans cannot assure a suitable service national in scope. Only the federal government through its broad powers of taxation can compensate for those differences in income which exist among individuals and among the lesser units of government.

After the fund has been collected through social insurance or taxation, arrangements must be made whereby the institutions and professions rendering service may be paid for their efforts. The great bulk of service in this country today is performed by voluntary hospitals and private practitioners; they need to be brought into the scheme. Methods of paying hospitals for their services have been developed under extensive voluntary insurance plans; these methods can be readily adapted to the requirements of a national health program. The problem of compensation for professional service is more complex. Inasmuch as fee-for-service has been a tradition, this with suitable controls may have to be accepted as one of the methods; however, the inherent defects in fee-for-service should be faced, and it should be recognized from the beginning that unsatisfactory experience may in time force more extensive utilization of other methods.

The subcommittee believes that the principle of free choice must be preserved for the public, the professions, and the institutions; namely, that patients shall be at liberty to select their physicians from among all who participate, subject to acceptance by the physicians; and to select their hospitals, subject to the practices and the staff arrangements of the hospitals; and that all qualified physicians and hospitals shall be eligible to participate in the program. This principle should apply to group as well as to individual action.

At the present time public medical care functions are being discharged through a host of agencies at all levels of government. The effective operation of a national program requires that at each level of government—federal, state, and local—administration, or the supervision of administration, should be by a single responsible agency. Because of their strategic position in the framework of government, their record of successful administrative experience, and their interest in prevention as well as cure of disease, health agencies are believed best fitted to discharge the responsibilities incident to administration of a nation-wide medical care program. However, any agency that expects to carry major responsibilities in a program of such magnitude and complexity should begin preparing itself now for the position it intends to occupy. When the public comes to consider where administrative responsibilities for a national health service shall be lodged, it will be influenced in large measure by the readiness for such duties displayed by the agency, by the initiative taken in fitting itself for the task, and by the eagerness shown in wanting to accept these responsibilities.

Perhaps of more interest to the members of this Association than the operation of a plan at the national level is its management locally. It is here where the program functions in relation to the needs of the people and where

the true measure of satisfaction is determined. Irrespective of whether the national program be a federal scheme or federally aided state schemes, it must operate through units of control that are in direct contact with the people who receive the service, and with the facilities and personnel through which the service is delivered.

The subcommittee gave thought to the proper size of jurisdiction for local service and to the relative advantages and disadvantages of state administrative districts as compared with districts composed of one or more existing political units. If, as the subcommittee believes, local health agencies should take a prominent part in the administration of medical care, it is difficult to escape the conclusion that material modification in the boundaries of local health jurisdictions must be effected in most, if not all, of the states. For the most part health agencies are built upon a foundation of law enforcement. Consequently, health jurisdictions conform, in the main, to local political boundaries. Many of these areas are too limited in population for efficient administration and their resources are so limited as to make it difficult for them to make any substantial contribution to a program, such as medical care, which involves large sums of money. Furthermore, neither hospitals nor physicians have been accustomed to draw their clientele from within the confines of existing local political subdivisions. In other words, medical service must continue to follow the natural lines of trade areas. Health officers are rapidly coming to the belief that public health jurisdictions also must be reshaped in similar fashion. Whether these areas be made administrative districts of the state, or become new political entities with considerable degree of local autonomy, must be left for determination by the state and local authorities concerned. In reality a decision either way is not of great importance from the standpoint of developing a suitable framework for medical service.

Under an acceptable plan of medical care the hospital must occupy a central position. In addition to providing beds for the more serious cases of illness, its facilities should be generally available for diagnosis and treatment of ambulatory patients and for appraisals of physical status. Before these purposes can be accomplished, it will be necessary to construct additional hospital accommodations in many rural areas where such facilities are nonexistent or wholly inadequate. Even in the larger centers of population a high proportion of present hospitals are in need of extensive alteration, or replacement by more modern structures.

When bringing the total bed capacity of hospitals throughout the country up to actual requirements, a concerted effort should be made to replace the individual and haphazard arrangement that has characterized hospital evolution to date by a planned development under national and state guidance. The scope of service in existing and proposed hospitals should be arranged so as to meet the needs of the localities in which they are situated and fit into both the state and the regional scheme of hospitalization. Under such a plan the modern medical center as well as the outpost first aid station will have its place.

Closely related to the location of hospitals is the placement of physicians and other medical personnel. A hospital without a competent medical staff is of questionable value, but on the other hand experience has shown repeatedly that a community cannot expect to attract and retain qualified physicians in sufficient numbers unless opportunities for hospital practice are afforded. A large part of the maldistribution of physicians could be corrected in short order if advantage

should be taken of the unusual opportunities that will attend demobilization of the armed forces for placing physicians where they are most needed. The presence of hospital facilities, together with the assurance that funds are available for the payment of medical bills, will go a long way toward effecting a permanent distribution of physicians in proportion to the population. For the more remote and sparsely settled areas some measure of direct aid in addition to the foregoing broad provisions may be necessary. Such instances should not be numerous and neither should the costs entailed be burdensome.

Under an expanded medical care program shortages of personnel no doubt will be experienced for most categories of service. This is likely to occur especially if the present pattern of practice is carried over into a national program. Dentistry perhaps represents the most critical situation. While this general subject of personnel requirements and methods for meeting probable needs deserves further study, the subcommittee pursued the matter far enough to be impressed with wastages of resources which normally occur. The average physician in private practice does not reach his maximum performance until age 40 and, after a period of about 5 years, a falling-off in output begins. The time of nurses consumed in maid and clerical services has been a subject of study and unfavorable comment for years. Now it would appear that many of the operations done by dentists could be assigned to persons of less training than that prescribed for graduation from dental schools. Much more work needs to be done in the way of job analyses before precise statements can be made regarding the extent to which subsidiary personnel can be used to lessen the demands for those in higher educational brackets. Likewise, a great amount of thought needs to be given to the training of auxiliary personnel themselves, and their certification for prescribed types of work. At present this whole matter is in a chaotic state. Until the entire subject of auxiliary workers has been fully explored it will be difficult to make calculations as to the needs for personnel with more extensive preparation.

Of all the groups that contribute to medical service the basic professional education of physicians seems to have been fairly well stabilized at sufficiently high level to assure good quality of medical graduates. If used to full capacity the present number of medical schools, or possibly with moderate increase, should be able to satisfy the normal needs for physicians by the population of the continental United States. The great unsolved problem in medical education is that of keeping physicians abreast of scientific and technical advances subsequent to completion of their formal education. This deficiency is especially apparent among physicians who, because of location or lack of hospital connections, become isolated from their fellow practitioners. The mere provision of additional hospitals and clinic facilities alone will not solve this problem. A continued educational influence must be infused into the system. This influence should emanate from teaching nuclei which may be located in medical schools or medical centers to which satellite institutions of the surrounding areas are related. In addition, individual physicians must be encouraged to pursue specialized courses so that the particular needs of each locality may be properly satisfied. Within reasonable limits these and other measures necessary for maintaining quality of service should be regarded as appropriate for public support, but should not be charges against the medical care fund proper.

From the very outset there should be a frank recognition of the fact that

any medical care program is certain to deteriorate unless research goes hand in hand with the provision of service. Hence the support of research, like the support of personnel training, must be accepted as a legitimate and necessary item in the over-all cost of medical care. When selecting topics for basic research, it would seem appropriate that primary consideration be given to conditions such as mental disorders and chronic disabling disease of advancing years, which tend to overburden any comprehensive program of medical care. In the normal course of operating a medical care program endless opportunities will arise for improving service and reducing costs; such matters constitute appropriate subjects for the administrative type of research. There will also be need for the pilot-plant type of installation in which new procedures are tested and perfected prior to full-scale application.

In the foregoing discussion an attempt has been made to set out the circumstances which prompted the preparation of the report of the Subcommittee on Medical Care, the subject matter considered, and the factors which determined the conclusions. Each of the problems under discussion has many facets. Papers that follow in this symposium represent attempts to describe in more detail the underlying factors which have precipitated out medical care as a national issue, and the corrective measures that seem applicable, together with appropriate methods of administration.

Content and Administration of a Medical Care Program

Unmet Health Needs *

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IT is the history and the proud tradition of modern public health that it is foresighted. It has attained its present high level not through accident —though unforeseen developments have played a part—but primarily through careful study and planned action.

Public health progress has depended on periodic review of accomplishments, planning to meet unmet needs, experimentation, concurrent evaluation of activities, and repetition of this time-tested and productive sequence.

This basic method of the public health campaign is being constantly applied, operating for the most part in quiet ways—without drama or crisis. Occasionally it is applied in more unusual fashion—as when some event or circumstance provides special reason to take stock or to meet new needs. An epidemic or some other catastrophe has sometimes precipitated action, so that something good and useful for the welfare of society was fertilized by the ashes of tragedy.

Today, American public health is confronted with unusual circumstance. The times demand unusual action—to make a special appraisal of unmet needs, to recognize the barriers to health progress, and to plan courageously and adequately how to level those barriers and how to meet those needs.

It is conceivable that, in a world in flames and disorder, we shall make a transition from war to peace without serious disruptions and by smooth and gradual stages; and it is possible that public health practice in the United States will pursue the even tenor of its way. But it is also possible that our society will be wracked by social and economic strains, and that the machinery and the practices of our health services will be deeply affected.

For a decade and more we have been hearing with increasing insistence that people have learned of the new and enlarged possibilities for health and that they demand a share in these opportunities. This demand has now swelled to large proportions. We of the public health profession should not fear and evade it; we should welcome it. And we should also note that the new public demand for health service is not so much in the traditional patterns of public health, with its primary concern for premature mortality, as in the newer patterns of social security, with its emphasis on assurance of needed medical and hospital care, and protection against the suffering and the economic burdens of sickness, disability, and dependency.

We have given some thought and attention to this subject in our Association. It is timely that we give it more.

* Presented before the American Public Health Association at the Seventy-third Annual Meeting in New York, N. Y., October 4, 1944.

PERSISTENT MORTALITY AND MORBIDITY

For some generations, public health administration leaned primarily on death rates to measure need, and on changes in these rates to measure accomplishment. The technical validity of that practice rested upon two assumptions—both more generally implicit than explicit—first, that public health was chiefly concerned with preventing the occurrence of preventable fatal diseases; and, second, because fatality rates were relatively constant, that changes in death rates reflected trends in the incidence of both illness and death. In the years when the greatest concern was with preventable infectious diseases, these assumptions were substantially valid; mortality rates were useful as primary indexes of health, and reductions in those rates were indexes of progress in the public health. But time marched on.

It is a striking fact—yet still widely unrecognized—that most sickness and most deaths in our times result from causes that we cannot control in the sense of preventing their occurrence. One has only to scan a list of the principal causes of either morbidity or mortality to see this plain truth.

We take great pride in the reductions that have been effected in the death rates—from about 17 or 18 deaths per 1,000 at the beginning of the century to about 11 per 1,000 in 1940. But we often forget that about 70 per cent of that reduction had already occurred by 1920, and practically 100 per cent by 1930. Such further reductions as have occurred among some causes and in some age groups are offset by increases elsewhere. Or, to take the matter in closer perspective, the prototypes of disease controllable by public health methods are typhoid and paratyphoid fevers, diphtheria, diarrhea and enteritis, measles, scarlet fever, whooping cough, and tuberculosis. Their aggregate death rates declined by about 83 per cent from 1900 to 1940; but about 56 per cent of that decline had already occurred by 1920, and about 84 per cent by 1930. It is true that much yet remains to be done in controlling these infections and we should press home their more complete control or eradication. We need to remind ourselves, however, that this group of preventable deaths was directly responsible in the last census year for only 1 death in 22. All other causes of death declined by less than 25 per cent in the first 40 years of this century; some among them show increasing death rates. We should be getting on with the job of tackling them as prevalent causes of disease and death.

The most common plagues that afflict us now are not preventable as causes of sickness or premature death by the traditional public health methods of community-wide control, or they are not preventable at all with present knowledge, methods, or skills. And, because of their concentration in the higher ages, the prospective aging of the population will increase the relative prevalence of these non-preventable illnesses.

MEDICAL CARE AS A PREVENTIVE SERVICE

Yet—if I may speak critically—we still act by patterns of public health practice as though preventable infectious diseases were our greatest problems, while we concern ourselves relatively little with heart disease, pneumonia, rheumatism, and other diseases which are vastly more prevalent and cause far more suffering and damage to human resources. These diseases which we cannot wholly prevent need early detection and accurate diagnosis; the patients need prompt, comprehensive, and continued care—home, office, clinic, hospital, laboratory, and other services—from the physician, dentist, nurse, laboratory expert or

pharmacist, and the host of others who stand behind them and support them. With these services public health has been relatively little concerned, because it has regarded medical care for the individual as being generally outside its field. In the past ten or fifteen years, the generously given advice "go see your family doctor" has been a feeble and futile substitute for a useful and effective program to assure the actual availability of services to those who need them.

This does not mean that public health practice has followed a consistent pattern of avoiding medical services, witness the long history of medical intervention by public health agencies in the case of tuberculosis and the more recent activity in respect to mental diseases, cancer, the venereal diseases, and the pneumonias. A few other examples, of uncertain generality, might be cited. Yet it still would be correct to say that public health practice has done and is doing little—very little, indeed, by comparison with the size of the need and the opportunity for useful service—about the commonest and most important causes of morbidity and disability; it still largely neglects to assure the availability of those services that would alleviate sickness and suffering where it admittedly cannot prevent the onset of disease.

In the past two or three decades, public health practice has shown a strong tendency to shun individual services. In the same periods, the public has become increasingly insistent in its demand for more and better individual services. These diverging trends explain in considerable part the continuing inadequate financial support of local public health activities. Lacking the public support that comes from the direct provision of personal service, public health officers have generally had an uphill fight in defending increased budgets for services that are for the most part vague and impersonal to the taxpayer.

Everywhere about us are people who have learned the new wonders that science holds for health. Their demand for services that will heal the sick is not to be met by new promises to prevent other illnesses that have not yet occurred. This demand has now reached such proportions that it cannot be much longer denied or ignored, especially because millions of people have learned there are ways of meeting the problems of costs that restrict the availability of needed services. There is now substantial agreement, nation-wide, that action will soon be taken. The public health professions cannot stand aloof.

The paramount issue before public health leadership in the United States concerns the place of medical services within the framework of public health practice. We are all agreed that the first function of public health is to prevent. But must prevention deal only with the initial occurrence or onset of a disease? Or shall it also mean that disease which cannot be prevented shall be recognized early in its course and treated promptly and effectively in order that human suffering shall be avoided; that the period of illness shall be shortened; that the course of the illness shall be moderated, shall not go on to more serious sickness, and shall not lead to further scarring and injury; that illness shall not lead to disability; that disability shall not be more prevalent than it has to be?

The practical import of these contentions is that medical care must be regarded as an integral part of a broad program of public health, one that embraces not only traditional community-wide services and special provisions already developed for particular diseases or special population groups, but also general diagnostic and treatment services for all members of the community. This involves the availability of med-

ical care of high quality, in early as well as late stages of disease, and ready access to the needed services throughout the entire period in which they are required. It also involves coördination of the diagnostic and treatment services with the more strictly preventive services—statistical, sanitary, laboratory, policing, educational, and administrative—and with the services for rehabilitation of the handicapped and the disabled. Also, having regard for the interrelations between poverty, disease, and dependency, the broad health program involves coördination with provisions for maintenance of income and for education, good nutrition, healthful housing, and other social purposes that are widely accepted as being essential or important to health.

The first unmet health need today is the design of a new public health program, adequate in both scope and content for our times.

SOME SPECIFIC NEEDS

If we are to enter upon a program of positive health and medical care for the people of this country, we must come to closer grips with the needs that are to be met. While taking into account the problems resulting from the war, we should hold them in perspective by reference to pre-war circumstances and post-war outlooks.

How much illness is there ordinarily in our population? No one knows exactly, especially because the amount of illness found in any group depends upon the intensity of the search made to discover it. Improved and enlarged reporting of morbidity is one of the important unmet needs. The deficiency has been partly overcome through special studies. By carefully combining the evidence from extensive and intensive surveys, it appears that on an average day at least 7 million persons are unable to carry on their usual pursuits because of disabling illness. Under conditions of careful reporting, the incidence of recognized illness is about 1 case per person a year, including in this figure both disabling and nondisabling illness, but omitting most minor illnesses and undiagnosed conditions. About 1 person in 5 suffers from a chronic disease or a major physical defect which needs medical attention. Many of these conditions are caused by the so-called "degenerative diseases" which so commonly prevail in middle age and in the more advanced years, and which usually need protracted and expensive care.

Whenever representative groups in our population are carefully examined, with the physician's skill supplemented by laboratory tests, vast amounts of neglected ill health and physical defect are uncovered. The large proportion of presumably healthy young men who were rejected for general military service because of defects and handicapping conditions is now well known; it came as a surprise only to those impressed by progress in the death rates and in the average expectation of living measured at birth or in the early years of life, and to those uninformed of the large number of people who do not receive the medical services they need.

There are many reasons why people who need medical care do not always receive it. The underlying causes are primarily economic. Medical care costs money. Illness and its costs are unpredictable for the individual, though they can be forecast with reasonable accuracy for the large group. The annual burden of sickness costs falls mainly upon a small proportion of the population, and usually comes unexpectedly upon the individual or family. In planning for better medical care, the most important characteristic of medical costs which must be surmounted is their uneven distribution among individuals and families.

Low-income families have more than

average amounts of illness, larger and more frequent need for care, and they spend a proportionately larger share of their incomes on sickness, yet they receive far less medical service than the well-to-do and the wealthy. For many, the costs constitute a barrier which prevents the receipt of needed care or any care at all. Below the level of the well-to-do, the percentage of illness which is without medical attendance rises steadily as income declines. Inadequacy of care and lack of care are especially widespread among the millions who live in rural areas. Those who are most familiar with rural conditions assure us that "modern medicine as we boast of it today is an urban phenomenon." And Negroes are generally worse off than white persons. It is easy to recognize how the vicious circle runs—illness causes poverty; poverty is associated with unattended and neglected illness. Which is cause and how much is effect cannot always be disentangled. We can be sure, however, that the circle needs to be broken from outside its perimeter.

POVERTY AND MEDICAL NEEDS

These generalized and summarized statements about sickness and medical neglect may be unimpressive to those not accustomed to think in statistical terms. If time permitted, the facts could be made more specific by referring not to all sickness or all kinds of medical care, but to tuberculosis, cancer, pregnancy, heart disease, pneumonia and other specific causes of illness, or to medical, dental, nursing, hospital or laboratory services.

It is so frequently repeated that the poor and the rich get good medical care, or the best medical care, that many have come to believe it. No doubt, one can see here in New York City, where we are meeting, numerous examples to illustrate receipt of the highest grade of care by the indigent poor—given by some of the ablest physicians in the city, in well-equipped hospitals and clinics operating at high levels of skill and efficiency. But who among us does not know that very few large cities and fewer smaller cities and almost no rural areas have made the provisions for the medical care of the poor that are to be found here? Those particular individuals among the poor so fortunate as to be served by leading clinicians in "free" clinics and "free" hospital beds may be receiving service of high quality. But this does not alter the fact—attested by scores of health or welfare studies—that in most urban areas and in nearly all rural areas poverty and lack of medical care go along together. It was true three-quarters of a century ago when this Association was founded; it is still true today, despite the widespread circulation of mischievous catchwords and clichés to the contrary.

INADEQUACY OF PERSONNEL AND RESOURCES

The correlation between family income and the adequacy of care received has a parellel in the correlation between community income and the availability of health and medical services.

At the beginning of the war, the United States as a whole was relatively well supplied with physicians. But the country-wide average of about 1 physician to each 750 people concealed wide variations from region to region, from state to state, and among urban and rural areas within states. The ratio was lower than average in low-income and in rural or sparsely populated areas. Specialists even more than general practitioners were concentrated in large cities and wealthy communities.

The lack of physicians in rural areas has been aggravated by the war; recruitment for the armed services was disproportionately heavy from states

and areas least able to spare them. It is probable that, with present methods of providing and paying for medical care, the return to peace and the demobilization of the armed forces will not bring improvement over the pre-war situation.

Maldistribution was even more marked among the dentists and probably among the nurses and hospitals. Where there was wealth, there were more or less ample personnel and facilities; where there was poverty, there was less or—in the extremest cases, even nothing.

Paying for medical care through individual purchase at the time the service is needed means inadequate care, insecurity, and burdensome costs for the patient. It also limits the financial security of the practitioners and institutions that furnish the service. The result appears in large variations in the incomes of practitioners, in low incomes for those who serve people of small or modest means, in inadequate financial support of hospitals, and—as noted before—in the maldistribution of professional personnel, hospitals, and other agencies.

The adequacy of public health services and facilities is also related to the prosperity or poverty of an area. Full-time, organized and adequate public health agencies are scarce enough the country over; they are especially deficient where wealth and income are less than average.

The unmet health needs of today include, in addition to those which I have mentioned, a few others of large importance. The need to strengthen the facilities for the education and training of personnel, to bring added support to research that will widen the boundaries of knowledge, to provide financial and technical aid for the construction of hospitals, health centers, and other facilities, I note only in passing; they will be examined at length by others participating in this program. The need to improve quality of care, and to assure economy and efficiency in the provision of service, open the large and controversial questions which surround proposals for the organized group practice of medicine. This is not the occasion to examine the issues at length. But this much may be said: No solution to the financial problems of medical care has to wait until the group practice questions have been finally answered. And no solution would be a good one, if it either "froze" the *status quo* of individual practice or failed to aid and encourage widespread and constructive experimentation in the methods of providing care.

SCOPE OF A COMPREHENSIVE PROGRAM

This brief review of unmet health needs may be summarized in even more general terms. The first need is for more adequate services than we have yet developed to prevent the occurrence of illness—including community-wide preventive services, such as modern public health practice already furnishes more or less comprehensively in the more progressive and wealthier areas or communities; and individual preventive services, perhaps best exemplified in maternity-advice centers and well baby clinics. The second need is for measures to assure ready and equal access to medical services for illness in which the occurrence is not, or cannot be, prevented but in which the duration can be abbreviated, the suffering reduced, the severity moderated, and the aftereffects either prevented or minimized. Such measures must provide for development of the social institutions essential to stable financing and orderly administration of the services to be included within a comprehensive program of medical care. Each of these two broad classes of need can be met only through a variety of provisions, including means of dealing with deficiencies and mal-

distribution in personnel and facilities.

Let me emphasize the futility of discussions, like those which have been common in the recent past, as to which of the two programs is the more important, or which should precede and which should follow. Both are necessary; each is urgent; one complements the other.

WE CAN AFFORD THE COSTS OF HEALTH

It is fair to ask whether, as a nation, we can afford to meet the unmet needs that have been outlined. This, in effect, asks whether we can afford the price of that level of health and that freedom from suffering which modern science and skill have brought within our reach.

Before the war, total expenditures for medical services were about 4 billion dollars a year (exclusive of the cost of medical care for the armed forces). About three-fourths of this total was spent by patients and their families—the direct consumers of medical care. Four to 5 per cent was contributed by industry and philanthropy. The remaining 20 per cent was spent by federal, state, and local governments.

The 3 billion dollars spent by the American people in direct family expenditures for medical care represented about 4 per cent of consumer income. Families in the lowest income groups spent a larger average percentage. Expenditures of no more than these amounts, but under arrangements which assured the widespread availability of medical services, could vastly improve the adequacy of care and greatly advance the public health. If only these amounts were spent, but in such a way as to enable each family to pay an average amount—year in and year out—the burden on consumers would be far less than it has been. These amounts could adequately compensate those who provide the services under arrangements which would assure them of regular incomes and, at the same time, avoid the unconscionable situation of having doctors without patients and sick people without doctors.

The pre-war level of expenditures for medical services, public and private, may not, however, have been fully adequate to pay the cost of services equal to our modern needs and standards. In the years ahead, especially if our economy operates with stability and at a high level of employment, our total expenditures for health and medical services might advantageously be expanded from the 4 billion dollars of pre-war years to as much as 5, 6, or even nearly 7 billion dollars a year under arrangements that will make adequate services and care available to the entire population. Those larger amounts for the future might be only 6 per cent of national income. This should be compared with the 5 per cent of national income (a total of about 3 billion dollars) expended about 10 years ago in times of deep economic depression when the degrees of economic freedom and the margins of flexibility in our expenditure patterns were very low indeed. These and all such figures should be measured against the 10 billion dollars commonly accepted as a conservative estimate of the direct and indirect annual costs of sickness and disability.

Like the growing and expanding social services generally, a strong health program is a necessity in every modern economy, because national wealth and well-being depend directly upon labor and productive work. There was a time when the social services were chiefly the gift of a few to the many, the charity of the rich to the poor. But today—and it will be more surely true in the future—the social services are for all, to be provided by the wealth and productivity of all. Moreover, the social services generally and the health services specifically are

not any longer to be financed by the "tax paying geese" that lay golden eggs; they are to be financed from the wealth of the entire society they serve. Modern society has been painfully and tragically slow in learning that the wealth of nations depends more upon the amount and the quality of the work we do than upon the amount of money we can avoid spending. As surely as health is prerequisite to work, so surely is it sound to earmark and spend for health up to the maximum that brings substantial returns.

Measured as a percentage of either family income or national income, we can afford health. In the words of a popular slogan, "it costs no more"; indeed, it costs less. We can less afford the higher price of sickness which we know how to prevent and of suffering, disability, and dependency we need not have. We are spending lavishly now for sickness and its consequences. We can resolve to spend wisely and productively for health. Thus, within the limits fixed by available knowledge and skill, by our human and material resources, by our courage, energy, and vision, comprehensive and adequate health and medical services for all are within our means.

CONCLUSION

The economic barriers to adequate health and medical services are inherent in our present hit-and-miss methods of meeting the costs; they are not inherent in the nature of the services that are worth having, or in the nature or the capacity of our economy. If the services continue to be inadequate, the fault lies not in the stars but in ourselves.

The unmet needs can be met. How they will be met—and how rapidly—will be influenced by the rôle the public health profession will choose to play in planning and guiding a program of medical care for the nation.

Content and Administration of a Medical Care Progam

A National Health Service: Scope, Financing and Administration *

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NO ONE, and least of all the public health worker, facing the facts of unmet health needs can escape the conclusion that a national health program is both desirable and inevitable. It is inevitable because the facts grow out of the daily experiences—the needs and the insecurity—of millions of people. These experiences are the exciting impulses behind the increasingly forceful demand for a more adequate distribution of the benefits of the health sciences. The chief issue, therefore, is not: Shall there be a national health program? Rather is it the much more technical question: How may the benefits of a national health program be distributed most successfully? This is the problem that should engage the attention and excite the imagination of the public health worker.

In its recommendations the Subcommittee on Medical Care has emphasized the elements of time and of orderly progress in the unfolding of a national health scheme. Desirable as it is to distribute the full benefits of science to the whole population immediately, the inadequacy of facilities and the unsatisfactory distribution of personnel make this an impossibility. Thus, the subcommittee visualizes an expanding program covering a period of ten years, a period during which intensive efforts will be concentrated upon the problems of physical facilities and personnel.

The need at the outset is for a plan of comprehensive scope. Unless there is understanding and agreement concerning the whole scheme, there is grave danger that the parts that must ultimately comprise the whole will develop as unrelated and badly fitted pieces. The best hospital and health center construction program in the world, taken by itself, will result only in hundreds or thousands of magnificent monuments to the builders' art. Add to the construction program a plan to activate the physical facilities with adequate personnel, and each hospital or health center becomes a place where medical care *might* be available if the economic barriers between the services and the people were reduced or leveled. Introduce the third factor, that of prepayment, and the plan as a whole becomes a dynamic force in the distribution of adequate care. These, with one other, are the basic parts of a national health scheme; to think that any one of them—construction, or distribution of personnel, or prepayment—can attain the objective of satisfactory national health is to think in fictions.

In scope, then, the national health plan must be conceived as, ultimately, embracing all services — diagnostic,

* Presented before the American Public Health Association at the Seventy-third Annual Meeting in New York, N. Y., October 4, 1944.

curative, preventive. And, since the distribution of such services now varies so widely, the plan at its initiation must be flexible enough to permit the full utilization of the services that exist in different communities or areas of the country.

Possible methods of financing a national health service have been indicated by the chairman. Whatever the method or the combination of methods, it should be recognized that a large part of the total funds for medical care does not constitute "new money" in the sense that it will be expended for entirely new purposes. Much of the total sum would be expended if there were no national health plan, just as it is being expended today without providing for the benefits that are envisaged in such a plan.

An endless amount of time might be spent, and doubtless much time will be spent, in debate upon the relationships between the federal and state governments in a scheme of national health. Such debate is interesting and provocative, but this is not the subject that should be the main preoccupation of the great majority of public health workers. There is another subject, much more difficult and much more productive of values, that demands the chief concentration of public health.

Between the stated objectives of a national health plan and their actual achievement there exists a broad, deep gap. To the public health worker this is no new phenomenon; it has many parallels in his own fields of effort—maternal and child health, malaria control, food sanitation. If there is to be any satisfactory achievement the gap must be filled with the solid materials of successful administration. Successful administration, then, is the fourth basic elements in a satisfactory national health plan. Unfortunately, too little attention has been given to it.

Public health may make a valuable contribution to all aspects of a national health plan; to its administration the contribution may be unique. Rare, indeed, is the health department that does not have within its own area some form or forms of medical administration. Whether it is the administration of the many types of federal, state, or local medical relief, or the present Emergency Maternal and Infancy Care program, or a Farm Security program, or a voluntary hospital or medical plan, much may be learned through critical examinations of the administrative processes. With many of these processes health departments are already involved and their accumulated experience has incalculable value—if it is accumulated.

Whatever may be the broad policy-making authority of the federal or the state governments, detailed administration must be centered where the people live and must be related to local conditions and needs. If administration is to become the function of any existing local agency, the health department is the logical choice. But, as always happens, the authority to administer is accompanied by specific and weighty responsibilities.

The first responsibility of the health department is to become acquainted with the existing administrative experience and technics. To say that "services must be rendered under conditions acceptable to the public and the professions concerned," has a soothing cadence. But for the administrator such relaxing phrases are not enough; he must prepare a written policy that sets forth precisely the acceptable conditions.

There is little doubt that one of the key problems of administration will involve the method or methods of payment for service, as well as the amounts that are paid. It is assumed also that, since it is the least departure from the traditional form of payment,

the fee-for-service will be the choice of the medical profession.

The local administrator owes it to himself, his department, and his community to become acquainted with the history and the administration of this form of payment. Furthermore, it is unfair to adopt or accept it with the assumption that it is foredoomed to failure. Under those circumstances failure is a certainty. The only fair approach is to apply to the method all of the administrative ingenuity that is possible and to devise new and more satisfactory technics of control. And on this subject the local health administrator will find, usually, that his own community has in it abundant research material.

The local administration of financing is not a necessary accompaniment of the local administration of services. Just as there are wide variations between the economic resources of states, so are there variations between districts or counties within states. Thus, while the local administration of services might be on a basis of the present or of reshaped health jurisdictions, the actual payment for services might be centralized for a number of such jurisdictions within one or more trade areas.

The point need not be labored that the administration of a national health plan calls for much more attention to those minute details that make up the daily administrative processes. It can be assumed that an over-emphasis upon paperwork will arouse antagonism. To the professions and the hospitals that anticipate and are prepared to resent this form of "red tape" it will come as a welcome evidence of administrative capability if paperwork is simplified. But simplification is never the result of just wishing for it. Too often are the purposes of medical administrative records confused with those of medical research records. And, too often, the result is a cumbersome and complex combination that produces administrative irritations and, at the same time, inadequate medical research.

With the fee-for-service as the method of payment, administrative controls must be devised. Unless they are better than those of the past they will be resented both by the public and the professions as examples of "bureaucratic interference." It would be well for public health to adopt and then to seek the methods of applying the principle that a successful control procedure is one which is neither irritating nor burdensome to those who do not need to be controlled—and that means the great majority of the professions, the hospitals, and the public.

To think of a national health program starting tomorrow produces mixed reactions. The potential results excite enthusiasm, but the lack of sufficient administrative personnel and a body of evaluated administrative experience act as curbs. Not for a moment should anyone assume that these lacks will postpone the adoption and the initiation of a national plan. Public action is never postponed until all administrative details are completed, and it follows that the safest course for the administrator is to anticipate and prepare to meet the public demand. The only other course, that of doing nothing and waiting, leads to emergency administration. And the very thought of administering a national health plan as though it were an emergency is appalling. For public health this is a "get ready" period; its values will be high or low according to how intensively this period is used.

Content and Administration of a Medical Care Program

Problems of Administration of a Medical Care Program *

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THIS paper deals with certain of the problems or issues in the administration of a health and medical care program and with the function of the health officer in relation to the program.

There is much discussion as to whether medical care administration should be on a wholly federal or on a federal-state-local basis. Whatever the force of arguments pro and con on this issue, it is plain that there must be decentralized control of health services, that the people of each local area must have a great deal of choice as to what their health services shall be and how they shall be administered. There must be latitude for different administrative arrangements and devices. Conditions and needs vary the country over and the state and its local communities should be free to develop arrangements best suited to their particular needs.

Our public health services have developed primarily on a state and local level of administration, and unless medical care is developed on the same basis, the possibilities of thorough-going integration will be greatly handicapped. Indeed, federal administration of curative services and state administration of preventive services would seem certain to perpetuate that separation of prevention and treatment which we wish to avoid, unless the state agencies assume major administrative responsibilities within the framework of a national program or system.

If it is assumed that the primary administrative responsibility for operation of the health care program will lie with the state, to what extent will the state government operate the program directly and to what degree will responsibility be delegated to local units of government?

It is obvious that this will vary in different states. The natural area for administration of a medical care program is the large metropolitan center with a variable amount of surrounding territory: the medical service area. Many communities are not self sufficient with respect to hospital and medical services. Rural people go into the nearby towns and small cities for physicians' services and, together with inhabitants of small towns and cities, go into the large metropolitan centers for certain types of specialist care and for care of major illnesses. In some states, especially those which have only one or two such medical service areas, it is almost inevitable that administration throughout the entire state will be by a state agency. Other states con-

* Presented before the American Public Health Association at the Seventy-third Annual Meeting in New York, N. Y., October 4, 1944.

tain more medical service areas, and here question will arise as to whether administration throughout should be by a single state agency or be delegated to local jurisdictions covering the several medical service areas. Special problems will be created by the numerous medical service areas which cross state lines.

It is quite likely that in some states it would be necessary, even with state administration, to divide the state into administrative districts, each such district comprising a medical service area. It might be necessary to develop, in some cases, a new, local governmental authority having responsibility for health services, because many existing county and city governments are unsatisfactory for this purpose. What is needed is a local authority which will have jurisdictional responsibility over an area roughly coterminous with a medical service area, i.e., combining city and countryside. Such a new local authority will have to be, in effect, a combination of several counties or of a city and several counties, in many states and parts of states.

The districts here envisaged for medical care administration would be appropriate for administration of public health services and of course should be identical. If such an integrated public health and medical care program is to be implemented, the district health authority should have a firm legal basis established by state legislation. Its board or council might well be made up of representatives of the councils or commissions of constituent counties or cities. Participation in this health district would have to be coercive upon the constituent counties—the district health authority could not function if constituent counties or cities could withdraw at will.

The next problem to be faced is the make-up of the state or district administrative unit. It is believed that responsibility for policy should be vested in a board composed of perhaps 10 to 20 members, part of whom should be representative of the medical profession, the hospitals, the dental profession, and other groups providing health services, but a majority of whom should be representative of the public. Such a board for state administration would be appointed by the governor, and for districts by the governing council (or other authoritative body) of the health district authority. Generally speaking, existing state boards of health would not be suitable for the responsibility without revision of their composition, since they usually have too many physicians in proportion to the representation of the general public. Responsibility for actual administration should be vested in a single person who would be responsible to the board. If the medical care program is largely or wholly financed by insurance contributions, there should be appropriate representation of the contributors as well as of those who furnish the services.

How will present health departments be integrated with the medical service administration? I am firmly of the opinion that ultimately all health services, both preventive and curative, at the state or at the district level, should be administered by one health agency. It is quite likely, however, that at the inception of the program some states will see fit to place administration of the medical service program in some agency other than the health department. Other states might vest administration in a reorganized department of health, in which what is now the health department would constitute a division responsible for preventive services.

Other factors to be given weight in considering the relationship of health departments to the new program are the potential size of the new programs and the inexperience of many present health department personnel in medical care administration. In terms of cost and number of personnel required for ad-

ministration, the new programs will dwarf the present public health programs. For these reasons, some states and localities may decide to set up a new agency to administer the new program. The degree of initiative shown by health departments in bringing about a medical care program and the extent of their eagerness to assume the responsibilities of its administration will undoubtedly be important factors in determining their relationship to the new program.

I think it may be assumed that any governmental medical care program, at least at the outset, will be merely a program for the payment of or distribution of medical services, and will be superimposed upon present methods of practice and provision of care with as little change in these methods as possible. In other words, general hospital care will continue to be provided mainly by voluntary hospitals as at present, and physicians' services will be provided by private practitioners paid on a fee or capitation basis—with some probably paid on whole- or part-time salaries or on salary payments combined with other kinds of payments. The main difference will be that hospitals and physicians will be paid out of an insurance or tax fund, contributed periodically on a group basis by sick and well alike, instead of being paid as at present, by the sick at the time service is rendered.

A technique of paying hospitals for their services from a central fund has been recently worked out by the Blue Cross Plans and the E.M.I.C. program; it has been done for a long time by public welfare agencies, medical care prepayment plans, etc. These methods can be used under a comprehensive health and medical care program. Techniques of paying for physicians' services from a central fund have similarly a long body of experience behind them and various alternative methods are available for use. The same may be said of paying for dental and nursing services.

When arrangements have been developed for paying hospitals and physicians for their services out of a central fund, there will be opportunity for improving the quality of care. Indeed, these problems will become so pressing that they cannot be avoided. Once hospitals are being paid out of public funds for their services to the population, it will be important to set standards as to quality of care which institutions must meet in order to qualify as hospitals. It will also be necessary to develop standards of efficient administration to assure that costs are kept to reasonable levels.

The question of group practice is important. Group practice provides a means whereby the quality of service can be elevated and its cost lowered. I believe that group practice will develop within the framework of a medical care program and that the program can do much of itself to stimulate such development, but I do not believe that it will be possible or desirable to force group practice upon the profession under a medical care program. What can be done is to permit free competition between group and individual practice. That is, we should pay all physicians as nearly as practicable on the same basis for their services.

If some desire to form groups, and by so doing can provide better service and thereby attract more patients, or if they can reduce the expenses of practice and thereby increase their incomes, they and the public will reap advantages which will in time lead other doctors to form groups. In short, to the extent that group practice is beneficial to the profession, the profession will adopt it. Here and there we have already seen group practice stimulated or even organized by public

groups, either in group clinics or around hospitals.

Development of group practice can be aided and encouraged, at least in rural areas, by the construction of health centers. Such a center can provide offices for doctors as well as central laboratory and x-ray facilities. Bringing doctors into proximity with each other will facilitate development of cooperative effort. The health center also provides an opportunity for coördination of medical care with community-wide preventive services.

I am quite familiar with some of the problems of western North Carolina, and I am of the opinion that we should do something to meet these problems. I think we could tie up medical care and public health by expanding the services of our present health centers; first, by increasing the number so as to make a health center accessible to all the people and second, by providing adequate medical care services along with our preventive health program. All medical, hospital, and other essential diagnostic aids and services should be made available at or in coöperation with the health center facility. At present the communities are not in a position to provide modern medical aids for themselves. Rural practitioners are rarely financially able to purchase them, and sometimes do not fully appreciate the need for them.

Leaders in the medical profession for some time have been recognizing the inadequate distribution of physicians and the lack of available medical care throughout North Carolina, and especially the western rural sections. To meet these immediate needs it would be well to establish in the near future accessible health center facilities in some sections of our state, where present medical and hospital services are so inadequate. Each of the centers should be provided with trained medical, nursing, and other necessary professional personnel to serve adequately the medical care needs of the population in the area in which the center is located. The facility should provide all the essential health services, both preventive and curative. A rural or semi-rural health center facility should provide a minimum of one physician, one public health nurse, one clinic nurse, a combination historian and clerk, and a laboratory technician. In the larger population centers the health facility should accommodate a number of physicians, public health nurses, clinic nurses, etc. Each facility should be constructed, staffed, and equipped for the specific locality and type of services to be provided. In some isolated sections it might be advisable to provide a small number of hospital beds to take care of the emergency medical problems of the area. The health facility medical personnel would administer office hour medical services of all essential types, both preventive and curative, comparable to the services commonly rendered by general practitioners in their offices to ambulatory cases, and home visits to persons living throughout the area served by the particular health facility.

COMMENT

An endeavor has been made to touch upon some of the more important problems in the administration of a medical care program. It is evident that on many points we are not yet ready to give final answers. We shall have to learn by doing, and as we set ourselves to the task, the problems, I am confident, will become less complex. One can be sure that the answers found to these administrative problems the country over will not be uniform. In one state or locality we will do it one way, in another state, another way. Methods and arrangements must remain fluid, one giving way to another as experience prompts. The rôle of the

health officer in all this is not clear, and must depend upon the course of events and his own efforts, but his opportunity is large.

In paraphrasing the committee's report our chairman advised health officers to begin now preparing themselves for the position they should occupy in the new administration of a comprehensive medical care program. He also added a word of warning to the effect that if health officers failed to show the necessary competence and enthusiasm for the job, the public authorities might seek other leadership. This raises the question as to where and how a health officer might secure the necessary training and experience.

When more normal times return and the demands on employed health officers lessen, it will be advisable for them to pursue formal courses of instruction. Such courses should cover the elements of health insurance, public administration, and hospital management. Preferably a full academic year should be devoted to this work but, for those who cannot spare so much time, much of the same ground may be covered through short refresher courses. It is recognized that the curriculum in most schools of public health does not make provision for these subjects. However, once the demand develops, schools of public health may be relied upon to meet their responsibility for this area of interest.

More immediate steps in the way of preparation for enlarged responsibilities in the medical care field may be taken by the health officer himself on his own initiative. In many communities some provision within his health jurisdiction is made for care of the indigent sick. This function may be discharged by a physician for the poor; it may take the form of payments to practising physicians; or there may be a well organized clinic for the purpose. The health officer should interest himself in this service and accept responsibility for its administration. It will be enlightening for him to become acquainted with its problems. Within most health jurisdictions there will be general hospitals, and the health officer should interest himself in their management. If the hospital is operated by the local government, it might well be placed under the direction of the health department. If it is a voluntary hospital, the health officer might become acquainted with its policies by serving on its staff or on its board of directors. Thus it is evident that there are many ways in which a health officer might become identified, in a manner adapted to local circumstances, with current medical care activities. In doing so, he could be adding to his own information and at the same time infusing the public health concept into the operating policies of these institutions.

Content and Administration of a Medical Care Program

Hospitals and Hospital Construction *

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"THERE are extensive deficiencies in the physical facilities needed to provide reasonably adequate services. Such facilities include hospitals, health centers, and laboratories. The needs are most acute in poor communities, in rural areas, and in urban areas where the population has increased rapidly or where the development of facilities has been haphazard or the financial support inadequate." So reads the statement on needs as officially adopted by the American Public Health Association, and published in this issue.

To meet this need it is proposed by the Subcommittee on Medical Care that the American Public Health Association sponsor, in coöperation with the American Hospital Association and other health agencies, a post-war hospital and health center construction program.

FEDERAL PARTICIPATION

At the federal level the program, to be administered by the U. S. Public Health Service, would provide grants and loans for the construction of new buildings and the modernization, alteration, and enlargement of existing structures, including equipment, but not the purchase of land. In the general hospital category non-profit institutions, both governmental and non-governmental, would share in federal aid, but it would be limited in the other categories (tuberculosis and mental hospitals, health centers, and other public health department facilities) to governmental institutions.

The federal government has established the precedent under the Lanham Act of financial assistance to non-governmental hospitals for emergency construction during the war. This principle is sound, because from the strictly legal standpoint the only difference between a governmental hospital and a hospital owned and operated by a non-profit corporation is in who holds title to the property. The board of trustees of the non-profit corporation in effect holds title and operates the hospital as a trust for the community it serves. For that reason it is exempt from taxation and enjoys other special privileges under the law. A study by the U. S. Public Health Service has shown that, for all practical purposes, the governmental general hospital serving all economic groups in the community is no different from the hospital owned and operated by the non-profit corporation. Its more or less autonomous governing board, usually appointed by the governing authorities, and its sources of income, ratio of free patients, and standards of service compare with its neighboring hospital owned and operated by a non-profit corporation.

Since governmental hospitals for the acutely ill and injured in the general

* Presented before the American Public Health Association at the Seventy-third Annual Meeting in New York, N. Y., October 4, 1944.

population care for only 10 per cent of all such patients and about 80 per cent are cared for in hospitals operated by non-profit corporations, limitation of federal assistance to governmental hospitals would not accomplish a great deal, unless the federal government builds hospitals to compete with existing non-governmental hospitals. That would not make sense, but in no event should federal funds be granted to a community for its hospital program where there is evidence of discrimination in the admission of patients on account of race, creed, or economic status.

STATE SURVEYS

Of equal and perhaps greater importance than federal aid with construction is the encouragement and assistance the Public Health Service will give each state with an inventory of its existing hospital and health department facilities and services and the planning of a long-range program intended to correct the weaknesses. This is a fundamental element in the program.

In most states the weaknesses are many and varied. As a general rule anybody anywhere can rent an old house, put some equipment in it, call it a hospital, and operate without supervision from any source. That is one reason why only 3,000 of the 10,000 institutions caring for the sick come up to the minimum standard for approval by the American College of Surgeons, and only 6,655 are registered by the American Medical Association.

Little is known on a national basis about the 3,000 or more other institutions of a nondescript character, because they are not subject to regulation except in two or three states and a few large cities. The absence of regulation and a definite plan and program for a national hospital service has caused duplication of effort in hospital construction and operation and the expenditure of tax funds and voluntary gifts on several small and inefficient units in a given community when one large unit is clearly indicated to give the most efficient and economical service. It is not necessary to recount the weaknesses in the public health service to this audience.

Federal grants should be made immediately to the states for surveys, which would disclose what needs to be done to improve or replace existing facilities and where additional units should be constructed, but no construction would begin until a congressional decision or a presidential declaration that the war emergency has eased to the point that labor and materials are available. Until that time only limited and very urgent construction needs should be met.

The survey itself is preferably a function of the state and it may be organized in any one of several different ways. The state planning commission or the state health department might sponsor it, or the governor might appoint an independent commission. The state hospital association might follow the American Hospital Association pattern for the nation by the appointment of an independent commission financed by private philanthropy. The important thing is to get the facts, evaluate them, and develop a workable plan that will eventually provide the people with all the essential hospital care and public health service they need according to modern standards.

This Commission on Hospital Care [1] was appointed by the Committee on Post-war Planning of the American Hospital Association for the purpose of studying the nation's resources for the institutional care of the sick and to propose a plan of action intended to improve and more effectively utilize these resources. This approach to the problem presupposes the weaknesses that have been indicated in the present organization of hospital service. This

independent commission, broadly representative of hospital administration, medicine, public health, dentistry, nursing, the farmer, labor organizations, industry, and the general public, is financed for a two year period by grants of $35,000 each from the Commonwealth Fund of New York, the National Foundation for Infantile Paralysis, and the W. K. Kellogg Foundation. Its report will be made to the nation and it plans to make detailed studies in Michigan and two or three other states from which a pattern will come for all of the other states to follow. This commission should work in close cooperation with the U. S. Public Health Service, and such coöperation is assured.

To carry out the state program will require legislation that will regulate the construction and operation of hospitals, including maintenance of high standards of service. Even the construction phase of the state program would be hampered without this cooperation on the part of the state, but where the state is slow or reluctant to act and the state health department, hospital association, local hospitals, and other health agencies will coöperate, the Public Health Service would be justified in making a study and assisting communities, hospitals, and health centers with construction in accordance with the master plan for the state. Federal aid should be available in such circumstances. Where the need exists, the probabilities are that the state government would eventually take action to make the program official, because of the pressure of public opinion.

When a state agency, such as the planning commission or the health department, sponsors the survey, the state (presumably through the governor) should appoint an advisory council composed of representatives from the hospitals, the health and architectural professions, labor, industry, agriculture, the general public, and other state agencies responsible for providing hospital and medical care and public health services.

STATE DISTRIBUTION PLAN

The state program would include not only the facts gathered in the survey, but also a master plan which would show what facilities should be constructed and where and when. Due consideration should be given to the interrelation between existing and proposed facilities within each service district as blocked out by the state agency.

For hospitals the service district would in general follow the trade area of the larger centers of population and the strongest teaching and diagnostic centers, usually found in these larger places, would be the "primary" hospitals. The "secondary" hospital centers, generally less comprehensive than the "primary" centers with respect to staff, specialists, and physical facilities, would still be strong enough to serve the satellite "tertiary" centers within the area for consultative and specialist services, especially because the "secondary" centers should be effectively linked with the "primary" centers. The "tertiary" centers would include, but not be restricted to, the small hospitals and health centers in rural and semirural areas.

The master plan would also reflect due consideration for the provision of general hospital and health center facilities to serve the residents of rural areas and as a means of inducing physicians to locate in such areas. The desirability of combining hospital facilities with the housing of offices for physicians, dentists, clinics, and health departments should be stressed.

The community hospital and the local health department have grown up separately and have never become well acquainted with each other. Health service for the people is indivisible.

The most efficient service at the lowest possible cost requires complete coördination of its three major components—the physician, the hospital, and the health department. In rural America, where all three of these components are comparatively inadequate and application of the principles of coördination is much simpler than in the large cities, the community hospital might well become the community health or medical center by placing the health department and the offices of physicians and dentists under the same roof.

The logical person to direct this combined health program is the public health officer, but with rare exceptions hospital administration has not been his function in the past. The wise health officer will compensate for this lack of training by employing a competent assistant who is experienced in hospital administration or by using as a consultant an experienced administrator in the nearest large city. Hospital administration may eventually become a part of the curriculum in the school of public health.

STATE ADMINISTRATION

A single state agency would be responsible for administration of the program (covering all types of eligible facilities) which would develop following approval of the state distribution plan. This would preferably be the same state agency which made the survey of resources and needs and formulated the state distribution plan. It is anticipated that it would be a different agency only in those states in which the creation of a new agency would be necessary for participation in this program and, in order to avoid delays, a temporary agency was created to initiate state action and to be responsible for the groundwork on the program until a more permanent state agency could be created. The responsibilities of this state agency administering the program would include the preparation of the state's periodic requests for federal funds, determination of the eligibility of individual projects to share in the federal funds, coördination of existing facilities so as to carry out the state agency's districting system, and supervision of the scheduling and progress of construction to insure adherence to the state plan.

In determining the eligibility of individual projects for participation in federal funds, assurance of the individual soundness of the project and of its conformity with the state plan from such standpoints as need for the facility, type of service, location, size, and coordination with other facilities within the same district would be necessary. There would have to be reasonable assurance of an adequate staff organization, efficient management, and proper financial support for effective operation when construction was completed. Plans and specifications would be approved by the Public Health Service prior to construction contract award, for no project would be eligible for federal aid without that prior approval.

The grants-in-aid to the states would be on a variable matching basis and the availability of funds to cover the non-federal contribution to the project would have to be assured. These funds might come from several different sources. The state, county, or municipal governing authorities might make contributions from tax funds, or from funds raised by bond issue, or by loans from the federal government. Private philanthropy would come strongly into the picture, as it always has in the past. The raising of the local contribution by mortgage on the non-governmental hospital should be discouraged and perhaps prohibited entirely.

FEDERAL ADMINISTRATION

The Surgeon General would, with the approval of the Federal Security Ad-

ministrator, issue regulations for the administration of this program. He would be advised by a council appointed by the Federal Security Administrator, or by the Surgeon General with the approval of the Administrator, and representing hospitals, the medical profession, public health agencies, the architectural profession, labor, industry, agriculture, and the general public.

The Public Health Service would, in coöperation with the professional organizations concerned, develop, for the guidance of the states, standards for the various categories of eligible facilities, pointing up necessary elements of construction and their interrelation.

SUMMARY

The major objective of this program would be a planned distribution of hospital and health center facilities that would serve all residents of those states and jurisdictions electing to participate. The planning would be done by the states, since planning at that level affords greater perspective than planning at a more local level, and at the same time assures consideration of area differentiations. The federal rôle would be pointed toward minimum supervision and maximum assistance in planning both the individual project and the general distribution of hospital and health center services for the purpose of providing each community with the best possible facility from the standpoints of architectural planning and economy of operation.

REFERENCE

1. *Hospitals*, 18, 8:23 (Aug.), 1944.

Content and Administration of a Medical Care Program

Training of Personnel and Research *

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THE provision of a comprehensive program of medical care requires a comprehensive plan for the training of personnel and their distribution on the basis of the needs of the population. The maintenance of a high quality of medical service, improvement of therapeutic technics, and the introduction of economies resulting from discoveries of methods of disease prevention are the objectives of the research which is a second essential foundation for a comprehensive medical care program. These basic principles have been recognized by the Subcommittee on Medical Care and are embodied in Recommendations VI, VII, and VIII of its Preliminary Report.

A nation-wide program of health and medical services will require the coordinated action of a wide variety of professional and technical personnel, including general practitioners, specialists, dentists, nurses trained for general bedside care, public health and other nursing specialties, medical social workers, sanitary engineers, health educators, laboratory specialists and the technicians, and auxiliary personnel required in hospitals, clinics, and health departments. An adequate health program will require greatly increased numbers of personnel in all of these fields. Numerous educational institutions, health and medical agencies and organizations must coöperate in a training program of this scope.

Physicians, nurses, and lay administrators must be trained for the specific administrative and supervisory duties of the medical care program. Expansion of the preventive services provided by health departments will require additional physicians trained as health officers and administrators of special activities, and public health nursing supervisors. As an immediate adaptation of such training to the personnel needs of the future, the subcommittee recommends that state health departments should utilize funds now available to prepare these personnel for the administration of medical as well as health services. This recommendation of the subcommittee is of special significance to this Association, since the necessary action on the part of state health departments and the schools of public health, more than any other single activity, may determine the rôle of the official health agency in the health program of the future.

The major emphasis of the research supported as part of a comprehensive health program should be placed on the control of diseases the care of which by present methods is so costly as to be difficult to finance adequately even with tax support. Mental disease, dental caries, rheumatic fever, particularly in its relation to the broad problem of diseases of the heart, and the processes of aging are among the fields

* Presented before the American Public Health Association at the Seventy-third Annual Meeting in New York, N. Y., October 4, 1944.

of research which should be subsidized from public funds. In addition, provision should be made for personnel research, administrative studies, and experimental demonstrations required for the improvement of organized methods of distributing health services, and the support of basic research by the faculty of educational institutions which is essential to the maintenance of professional standards.

TRAINING OF PERSONNEL

Scope of the training program—The training program is concerned with the basic and postgraduate education provided by medical schools, schools of public health, dental and nursing schools, by selected departments of university graduate schools, and with certain types of technical and vocational training below the professional and graduate levels. However, its educational objectives extend beyond preinduction training to training in service; hospitals, clinics, state and local health departments, special educational demonstrations, field training centers, and professional public health and medical associations must be coördinated in the general program.

The training program should include funds for the following purposes:

1. Scholarships for unusually gifted students who otherwise might not be able to pursue basic health and medical education
2. Grants for postgraduate education of health and medical personnel, including refresher courses
3. Grants for the promotion of postgraduate education among the faculty of the professional schools concerned
4. Grants to aid in the organization of new training and demonstration facilities required, including professional schools, individual university departments, coördinated facilities for continuation study, field training centers and experimental demonstrations
5. Support of studies to aid in the wise allocation of training funds, including periodic estimates of overall personnel needs, methods of selecting properly qualified trainees, re-examination of the content of various basic professional curricula, and the development of criteria for the approval of educational and other institutions participating in the program

Medical education—It has been estimated that as many as 25,000 additional physicians might be required to render adequate service to the post-war population. Continuation after the war of the present emergency program in medical schools until the physician deficit is removed would be one way of meeting the issue. However, under the most favorable circumstances, not for some time to come is it likely that such an increase in physician output can be anticipated. As an immediate adjustment to the situation, it is extremely important that the time and energy of physicians be utilized to full capacity.

To this end, the training program should make special provision for the appraisal and possible extension of existing facilities for the training of established types of medical technicians and other auxiliaries, and for investigations of methods of utilizing new types of subordinate personnel. Large well organized clinics have recognized the economy in having such services as admissions, history taking, temperature and blood pressure readings performed by non-medical personnel. While the utilization of such auxiliaries would increase the time available for professional service by the private practitioner, his individual resources cannot support their employment at present. The increase in group practice which would probably take place under a comprehensive plan of medical care should increase the utilization of nurses, laboratory and x-ray technicians, and other technical personnel in the performance of many services which the individual practitioner now provides singlehanded. The technic of the job analysis should be applied to the physician's working schedule, under conditions of both individual and group

practice, to determine the possibility of transferring additional technical procedures to appropriate subordinate personnel.

In addition to an increase in the number of physicians, a major need in the field of undergraduate medical education is a reorientation of the present curriculum. There should be increased emphasis in undergraduate medical teaching on methods of keeping well people well. Furthermore, the content of the course in preventive medicine should be widened to include the broad field of organized medical care, comprising both prevention and treatment, and a consideration of the social factors involved. Such revisions of the medical curriculum eventually should produce medical practitioners whose basic training has prepared them to meet the objectives of a comprehensive health service. It is hoped that a by-product of such changes in undergraduate medical education would be the presentation of administrative medicine and public health as desirable fields for specialization.

Within the resources of the program, financial aid should be made available to hospitals to raise the educational standards of the internship and residency according to the principles formulated by the Commission on Graduate Medical Education.[1] Funds should be provided to enable hospitals to support residencies in critical specialties which would not otherwise be offered, and to encourage their election by an adequate number of qualified candidates.

Medical schools and hospitals should be coördinated in a broad program of continuing education for general practitioners and specialists after they have entered practice. At the outset, a formal system of continuation study should be organized. As the construction of hospitals, clinics, and health centers provided under the national program proceeds, increasing facilities for clinical experience and consultation, the education of the general practitioner will become in fact continuous, and formal courses less necessary. The program of postgraduate education for general practitioners should include organized periodic refresher courses in clinical medicine and opportunities for short periods of intensive study of individual subjects. The Committee on Post-war Medical Service and the Council on Medical Education and Hospitals of the American Medical Association are now actively engaged in planning to meet the training requirements of physicians in the period of demobilization. The coöperation of the Public Health Service, Veterans' Administration, of hospitals, medical schools, American boards in the medical specialties, and other agencies in these plans for post-war medical training suggest the type of joint effort which will be required in a national training program.

Graduate education in public health—Medical administrators required to coordinate services at the local level will present an urgent personnel need under a comprehensive medical care program. The subcommittee believes that the schools of public health are the appropriate training institutions for personnel of this type. The curriculum of the leading schools of public health has been developed to meet the needs of two broad classes of trainee, medical and non-medical. The basic curriculum now offered for medical trainees, typified by the health officer, should be revised to meet the training needs of other types of medical administrators, including those required in local medical care programs, and in the administration of hospitals, clinics, and health centers. In the construction of this basic curriculum in administrative medicine and public health, attention should be given to the need for instruction in the principles of administration, including per-

sonnel management, staff education, program planning, and the financial procedures involved in the administration of public agencies. Additional courses should be introduced to permit medical trainees to elect specialization in the administration of medical care programs, the administration of hospitals or other medical agencies, general public health administration, or the administration of special public health activities such as venereal disease control, tuberculosis control, etc. While no single school should be expected to develop so broad an educational program, facilities for training in all of these specialties should be available in one or another of the schools of public health.

Finally, it is desirable that the training program in organized medicine and public health include field experience in agencies providing the types of service which the trainees plan to enter. The high cost of maintaining field training centers with adequate full-time teaching staff will limit greatly the number of these centers which the schools of public health can provide. Financial support of such centers in health departments and other agencies in a number adequate to meet the needs of the national training program should be provided as part of the overall costs of medical care.

Approval of existing schools of public health for financial aid under a national medical care program should be based on their satisfaction of appropriate educational standards. The Association of Schools of Public Health in coöperation with the Public Health Service is now engaged in a preliminary appraisal which will contribute some bases for rating the effectiveness of the schools. However, extension of personnel research is a prerequisite for the construction of an adequate curriculum for the schools of public health.

The post-war population would require 4,100 physicians to staff its local health departments if each population unit of 100,000 had a health officer and two medical bureau directors; in addition, it is estimated that 1,400 physicians would be required by the state health departments and the U. S. Public Health Service. This combined total of some 5,500 public health physicians required under an expanded public health program exceeds by 2,400 the number of public health physicians employed before the war. Such a shortage of public health physicians, combined with the need for administrators of the medical care program, might greatly increase the number of medical trainees seeking admission to the schools of public health in the post-war period.

It is estimated that immediately prior to the war the schools of public health had a combined capacity for approximately 200 medical trainees as candidates for graduate degrees or certificates requiring at least one full academic year of study. The facilities of some of the existing schools of public health probably could be expanded to accommodate a small number of additional medical trainees, but new schools would be essential if the increase in applicants were substantial. Financial aid to promote the expansion of existing schools of public health and the organization of new schools should be included as part of the essential costs of the program. With respect to non-medical public health personnel, studies should be undertaken to determine the appropriate training field of the schools of public health and of other educational institutions. For example, it seems possible that expansion to provide additional training facilities for certain types of technical (non-medical) public health personnel could be made with greater economy by the graduate schools of certain universities than by the schools of public health. Investigation of facilities for the training of technical public health personnel not requiring education at

the graduate level should form part of this program of studies.

The effective use of training opportunities provided under the program should be insured by the selection of trainees having personal qualifications for the type of position they expect to fill. An essential requirement of a system of trainee-selection for administrative medical personnel is a field center in which the trainee's aptitude for administrative duties may be appraised before he enters a period of formal training at a school of public health. New York State has devised a system which includes a field assignment of 6 to 12 months' duration, rotating among the state health districts with final observation in the central office.[2] However, the needs of the training program may require federal assistance in the selection of trainees. Such assistance might take the form of a national screening center for potential trainees, or a decentralized system developed in the field training centers.

Training of nursing personnel—While available estimates of the number of nurses needed for a comprehensive health and medical care program are not in agreement, they rest on the common assumption that the volume of nursing service will be increased greatly. A considerable body of professional opinion believes that this need should be met by a gradual reduction in the number of graduate professional nurses trained each year with an improvement in their educational program, accompanied by a gradual increase in the number of vocational (practical) nurses. It has been estimated that in its tenth year of operation a program of adequate public health and medical services would require about 300,000 graduate professional nurses, annual admissions of about 30,000 students to professional schools of nursing, and about 180,000 vocational nurses. This compares with present figures of about 260,000 graduate nurses (including those in the armed forces), 65,000 admissions to professional nursing schools, and about 70,000 auxiliary personnel.

Under an expanded health program, it seems probable that public funds would be needed to train the required number of graduate nurses for public health, psychiatric practice, and other specialties, as well as to support an adequate training program for vocational nurses. The use of auxiliary personnel in the field of nursing should receive special study in view of the probable shortage of professional nurses. Under the supervision of graduate nurses, auxiliary nursing personnel can give effective service in public health clinics, in the school health program and in selected types of home visiting. The war has demonstrated the value of nursing auxiliaries in institutional care of the sick. Aside from the need for funds, the training program should provide for technical studies bearing on the development of educational standards for the training of vocational nurses and other nursing auxiliaries. In this connection, it is of interest that the U. S. Office of Education at present is sponsoring a plan for the organization of an educational institution to train vocational nurses, supported by Smith-Hughes funds.

Personnel problems in dentistry—The present disparity between the receipt of dental care and the true dental needs of the population is so marked that society probably could not support its correction solely through an increase in the number of dentists. In the immediate pre-war period (1940), approximately 70,000 dentists were engaged in practice. Klein has estimated that approximately 130,000 dentists, or almost twice the pre-war number, would be required for the care of the dental disease and defects incident each year; and with the present capacity of dental schools doubled, their training would

take more than a generation. This estimate does not take into account the dentists required to care for accumulated dental needs.[3]

Long-range planning is therefore essential for the ultimate provision of adequate dental care. A fundamental requirement of such a program is the initiation of research in the cause and control of dental disease. A second essential is the eventual elimination of the problem of accumulated dental needs by the provision of the dental services required each year to maintain the dental health of children. Continuing research in methods of increasing the productivity of the available dentists offers a third approach to the problem. Klein has shown that the simple expedient of adding an extra chair to an individual dentist's office increases the volume of work he performs by 25 per cent, and the addition of a chair and a dental assistant, by 63 per cent.[4] Exploration of new uses for dental assistants, dental hygienists and other auxiliary personnel offers a means of further increasing the productivity of dentists. While dentists probably could assign many of their operations to dental hygienists, only 3 per cent of the dentists included in Klein's survey employed dental hygienists.[4] Thus, in dentistry as in medicine and nursing, studies of the more effective use of auxiliary personnel, and financial assistance for their training and utilization are an essential part of the broad personnel program.

Distribution of service personnel—The subcommittee has recommended that professional and financial stimuli should be devised to encourage physicians, dentists, nurses, and others to practice in rural areas. Plans to encourage the rational distribution of physicians should be developed as quickly as possible in view of the coming demobilization of the armed forces. Since diagnostic and therapeutic technics are constantly changing, alert and ambitious physicians have been reluctant to locate in rural areas where professional association is restricted and hospital and laboratory facilities are inaccessible. As hospitals and related facilities are provided in the rural areas, rural practice will become more attractive to young physicians, and their continuing education will be assured.

The immediate need, however, is an integration of the services of hospitals and health centers to make available to physicians in smaller cities and rural areas the educational advantages of these institutions. Periodic refresher courses should be provided in the large medical teaching centers. Establishment and support of a corps of substitutes to carry on the work of physicians during absence from their communities while attending refresher courses, should serve as a stimulus to broad physician participation in such a program. The circuit courses developed by some of the state medical societies represent a type of course adapted to physicians in areas remote from the large teaching centers. The postgraduate medical program conducted by the Bingham Associates Fund in coöperation with the Tufts College Medical School is an interesting example of a decentralized training plan for physicians in the small communities of New England.[5]

Finally, steps must be taken to equalize the income of urban and rural practitioners. Arrangement — either through insurance or tax supported plans—to compensate for the inability of many individuals to purchase medical care may accomplish this end only in part. As a further incentive to physicians to settle in rural localities, it may be necessary to provide government financial aid for rural practitioners. By this means it may be possible after the war to attract physicians to the communities most in need of

medical service. Particularly, demobilized physicians, who entered military service after the completion of intern training and left no established practice, might be amenable to this arrangement.

To assure a continued supply of young physicians to rural areas, consideration might well be given to the feasibility of financial aid for the basic education of medical students who agree to serve in rural areas. Under such a system, assignment of new graduates to under-staffed communities should be facilitated.

RESEARCH

The subcommittee has recommended that funds for the support of research be included in the overall costs of a comprehensive medical care program. Funds should be made available to federal, state, and local governmental agencies for research and for grants-in-aid to private non-profit institutions for the support of basic laboratory and clinical research and for administrative studies and demonstrations designed to improve the quality and lessen the cost of services. It is the belief of the subcommittee that governmental action is necessary in health and medical research to insure the continuity of research programs and to facilitate the coöperation in the research problems in this field of the variety of professional skills so often necessary for their solution. Some of the work should be done in federal government centers and a large part in state and local educational and other institutions, public and private, assisted where necessary through grants-in-aid. In other words, there should be planned action and the coördinated activity of research workers in medicine and its underlying sciences, engineering, statistics, economics, public administration, and the other great variety of fields having a part to play in the development of a program of health and medical services.

The research problems selected for public support would be those whose solution would bring a substantial improvement in health and a reduction in the costs of the national medical care program. The national research program should give early attention to administrative studies of methods of distributing medical services appropriate to the varying needs of urban and rural groups. The pattern of a program for organized home and office care of the sick is being established by the prepayment plans now operating under state and local medical societies, industry, and various consumer groups, and by the existing system of public medical care. However, governmental support of experimental demonstrations and other research projects in this field will be essential to supply the technical information required to direct expansion of the medical care program. Personnel research is a related field of investigation which should be supported from public funds, and experimental demonstrations and field centers will be required where the effectiveness of new types of subordinate personnel as professional aides may receive practical testing.

The program should support research studies of problems emerging from new and special situations which are beyond the resources of private research institutions alone. Examples of such fields of investigation are the tropical diseases, medical climatology, and the potential industrial health hazards resulting from the use of new materials and processes developed during the war. Aside from the special health problems of industry created by the war, the program should provide for an adequate expansion of the industrial hygiene research in progress prior to the war. Research in this field is of recent origin in this country. Because of the variety of professional skills and the specialized laboratory facilities required in the investi-

gation of industrial health problems, public support is essential to the extension of our knowledge of methods of protecting and improving the worker's health. Research in industrial feeding is an allied project for which public funds should be made available. In addition, nutrition research should provide support of investigations in the prevention and diagnosis of the deficiency diseases, and methods of nutrition education.

A coördinated program of research on dental caries and other oral diseases is another major field of investigation requiring public support. It has been shown that a community water supply containing small concentrations of fluorides materially decreases the incidence of dental caries. A broad program of studies of the epidemiology of this disease and the possibilities of fluoride therapy holds promise of discovering a basis for its control. Research in other oral diseases is equally urgent. In no other field of public health is the demand for research more pressing or the etiology more obscure.

The nervous and mental diseases should receive major emphasis in a national research program. While a large proportion of public funds for medical care is diverted to institutional care of the mentally ill, there is relatively little public support of research in methods of prevention of mental disease. The cardiovascular-renal group of diseases provides another example of the chronic diseases presenting urgent research problems which are being approached inadequately through private effort. Public support of research in tuberculosis, cancer, and the venereal diseases already has received legislative and professional approval. A national research program should extend public funds for research in the chronic diseases and in the general problems associated with aging.

The central coördination of research activities in these major fields will be essential to the effective operation of the program and the evaluation of results. It is believed that research facilities under the direction of an appropriate federal agency should be organized to fulfil this function. These centers would include laboratories and clinical facilities for research as well as the necessary administrative activities.

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Medical Care in a National Health Program

An Official Statement of the American Public Health Association Adopted October 4, 1944

AT the annual meeting of the Committee on Administrative Practice of the American Public Health Association, October 9, 1943, the committee directed its Subcommittee on Medical Care to draft a set of principles expressing the desirable content of a comprehensive program of medical care, the methods of its administration, and the part which public health agencies should take in its operation. In pursuit of this assignment, the subcommittee completed a tentative draft, which was considered and adopted by the Committee on Administrative Practice at its meeting, October 1, 1944. The report was then transmitted to the Governing Council of the Association where, after certain revisions, it was adopted as a statement of Association policy.

Because of its composition and charge, the subcommittee has limited its considerations to one sector of a comprehensive national health program, namely, medical care.

In preparing the report, the subcommittee has considered:

A. The needs for a national program for medical care

B. The objectives of such a program

C. Recommendations for immediate action

The American Public Health Association through its national organization and its constituent societies stands ready to collaborate with the various professional bodies and civic organizations which may be concerned with either the provision or receipt of medical service with a view to implementing the following general principles:

A. THE NEEDS

I. A large portion of the population receives insufficient and inadequate medical care, chiefly because persons are unable to pay the costs of services on an individual payment basis when they are needed, or because the services are not available.

II. There are extensive deficiencies in the physical facilities needed to provide reasonably adequate services. Such facilities include hospitals, health centers and laboratories. The needs are most acute in poor communities, in rural areas, and in urban areas where the population has increased rapidly or where the development of facilities has been haphazard or the financial support inadequate.

III. There are extensive deficiencies in the number and the distribution of personnel needed to provide the services. Here again, the needs vary according to categories of personnel and to characteristics of communities.

IV. There are extensive deficiencies in the number and categories of personnel qualified to administer facilities and services.

V. Many communities still are not served by public health departments; others inadequately maintain such departments. Thus, some communities

have never utilized organized health work to reduce the burden of illness, and others share its benefits only in part. In these communities especially, people lack information on the benefits of modern medical care.

VI. Expansion of scientific research is urgently needed. Despite past and current scientific advances, knowledge as to the prevention, control, or cure of many diseases is lacking.

Each of the six conditions defined above can be broken down into many component parts representing specific needs. In general, however, solutions of these broad problems require simultaneous attack on four fronts: namely, the distribution of costs, construction of facilities, training of personnel, and expansion of knowledge.

B. THE OBJECTIVES

I. A national program for medical care should make available to the entire population all essential preventive, diagnostic, and curative services.

II. Such a program should insure that the services provided be of the highest standard, and that they be rendered under conditions satisfactory both to the public and to the professions.

III. Such a program should include the constant evaluation of practices and the extension of scientific knowledge.

C. RECOMMENDATIONS

The recommendations presented in this report represent guides to the formulation of a policy for action. It is believed that study of these recommendations by the professions and others concerned in the states and localities will produce new and more specific recommendations for the attainment of the objectives of a national health program.

Recommendation I. The Services

a. A national plan should aim to provide comprehensive services for all the people in all areas of the country. In light of present-day knowledge, the services should include hospital care, the services of physicians (general practitioners and specialists), supplementary laboratory and diagnostic services, nursing care, essential dental services, and prescribed medicines and appliances. These details of content must remain subject to alteration according to changes in knowledge, practices, and organization of services.

Because of inadequacies in personnel and facilities, this goal cannot be attained at once; but it should be attained within ten years. At the outset, as many of the services as possible should be provided for the nation as a whole, having regard for resources in personnel and facilities in local areas. The scope of service should then be extended as rapidly as possible, accelerated by provisions to insure the training of needed personnel, and the development of facilities and organization.

b. It is imperative that the plan include and emphasize the provision of preventive services for the whole population. Such services include maternity and child hygiene, school health services, control of communicable diseases, special provisions for tuberculosis, venereal diseases, and other preventable diseases, laboratory diagnosis, nutrition, health education, vital records, and other accepted functions of public health agencies, which are now provided for a part of the population.

c. In so far as may be consistent with the requirements of a national plan, states and communities should have wide lattitude in adapting their services and methods of administration to local needs and conditions.

Recommendation II. Financing the Services

a. Services should be adequately and securely financed through social insur-

ance supplemented by general taxation, or by general taxation alone. Financing through social insurance alone would result in the exclusion of certain economic groups and might possibly exclude certain occupational segments of the population.

b. The services should be financed on a nation-wide basis, in accordance with ability to pay, with federal and state participation, and under conditions which will permit the federal government to equalize the burdens of cost among the states.

Recommendation III. Organization and Administration of Services

a. A single responsible agency is a fundamental requisite to effective administration at all levels—federal, state, and local. The public health agencies —federal, state and local—should carry major responsibilities in administering the health services of the future. Because of administrative experience, and accustomed responsibility for a public trust, they are uniquely fitted among public agencies to assume larger responsibilities and to discharge their duties to the public with integrity and skill. The existing public health agencies, as now constituted, may not be ready and may not be suitably constituted and organized, in all cases, to assume all of the administrative tasks implicit in an expanded national health service. Public health officials, however, should be planning to discharge these larger responsibilities, and should be training themselves and their staffs. This preparation should be undertaken now because, when the public comes to consider where administrative responsibilities shall be lodged, it will be influenced in large measure by the readiness for such duties displayed by public health officers and by the initiative they have taken in fitting themselves for the task.

b. The agency authorized to administer such a program should have the advice and counsel of a body representing the professions, other sources of services, and the recipients of services.

c. Private practitioners in each local administrative area should be paid according to the method they prefer, *i.e.*, fee-for-service, capitation, salary, or any combination of these. None of the methods is perfect; but attention is called to the fact that fee-for-service alone is not well adapted to a system of wide coverage.

d. The principle of free choice should be preserved to the population and the professions.

e. State departments of health and other health agencies are urged to initiate studies to determine the logical and practical administrative areas for a national medical care plan.

Recommendation IV. Physical Facilities

a. Preceding, or accompanying, the development of a plan to finance and administer services, a program should be developed for the construction of needed hospitals, health centers, and related facilities, including modernization and expansion of existing structures. This program should be based on federal aid to the states and allow for participation by voluntary as well as public agencies, with suitable controls to insure the economical and community-wide use of public funds. The desirability of combining hospital facilities with the housing of physicians' offices, clinics, and health departments should be stressed.

b. Federal aid to the states should be given on a variable matching basis in accordance with the economic status of each state.

c. Because of its record of experience and accomplishment in this field, the U. S. Public Health Service should administer the construction program at

the federal level, in coöperation with the federal agencies responsible for health services and construction.

d. Funds available under this program should be granted only if:

(1) The state administrative agency has surveyed the needs of the state for hospitals, health centers, and related facilities, and has drawn up a master plan for the development of the needed facilities (taking account of facilities in adjacent states); or, in the absence of a state plan, the project is consistent with surveys of construction needs made by the U. S. Public Health Service;

(2) The proposed individual project is consistent with the master plan for the state; its architectural and engineering plans and specifications have been approved by the state agency and/or the U. S. Public Health Service; and there is reasonable assurance of support and maintenance of the project in accordance with adequate standards.

e. State health departments are urged to conduct studies to develop state plans for the construction of needed hospitals, health centers, and related facilities. Such studies should be made in coöperation with official health agencies, with state hospital associations, and other groups having special knowledge or interests.

Recommendation V. Coördination and Organization of Official Health Agencies

a. The activities of the multiple national, state, and local health agencies should be coördinated with the services provided by a national program. There is no functional or administrative justification for dividing human beings or illnesses into many categories to be dealt with by numerous independent administrations. It is difficult to reorganize agencies or to combine activities, and this cannot be accomplished hurriedly. Therefore studies and conferences should be undertaken without delay at the federal level, and in those states and communities where the health structure is already unnecessarily complex.

b. The federal and state governments should provide increased grants for the extension of adequate public health organization to all areas in all states. Increased federal grants should be made conditional upon the requirement that public health services of at least a specified minimum content shall be available in all areas of the state.

Recommendation VI. Training and Distribution of Service Personnel

a. Within the resources of the program, financial provisions should be made to assist qualified professional and technical personnel in obtaining postgraduate education and training.

b. The plan should provide for the study of more effective use of auxilliary personnel (such as dental hygienists, nursing aides, and technicians), and should furnish financial assistance for their training and utilization.

c. Professional and financial stimuli should be devised to encourage physicians, dentists, nurses, and others to practise in rural areas. Plans to encourage the rational distribution of personnel, especially physicians, should be developed as quickly as possible, in view of the coming demobilization of the armed forces. Such plans should be integrated with the whole scheme of services and the establishment of more adequate physical facilities.

Recommendation VII. Education and Training of Administrative Personnel

a. Education and training of administrative personnel should be encouraged financially and technically, especially for those who may serve

as administrators of the medical care program, for hospital and health center administrators, and for nursing supervisors.

b. State health departments should utilize those funds that may be available to train personnel in such technics as administration of health and medical services, and hospitals. Such a training program may contribute more than any other single activity to the future rôle of the official public health agency. As a corollary, the attention of schools of public health is directed to the importance of establishing the necessary training courses.

Recommendation VIII. Expansion of Research

a. Increased funds should be made available to the U. S. Public Health Service and to other agencies of government (federal, state, and local), and for grants-in-aid to non-profit institutions for basic laboratory and clinical research and for administrative studies and demonstrations designed to improve the quality and lessen the cost of services.

b. The research agencies and those responsible for making grants-in-aid should be assisted by competent professional advisory bodies to insure the wise and efficient use of public funds.

Educational Implications of the School Health Program*

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THIS war is an opportunity and a challenge to health education. Youth and adults easily grasp the importance of total fitness in war. This is illustrated by the results of medical examinations of high school boys for the Physical Fitness Victory Corps Program. A substantial number of these youths are found to have physical abnormalities which are amenable to treatment. It has been a common experience in many parts of the country that within a few months practically 100 per cent of the boys have secured medical attention. A study of their previous medical records has shown that the vast majority have had their physical defects for some years—without securing treatment. Herein lies one of the unknown elements of health education. We apparently have yet to learn how to get action. Yet, incentives for physical fitness are not necessarily dependent upon a war atmosphere for a desire for war service. In peacetime the same quick response is observed in connection with the medical examination of girls and boys who apply for working papers. The urgency of a prospective job leads to their securing treatment for conditions which have existed and been known to them for some time. But the point is that, in war or peace, too frequently some other factor, not the health examination, is the motivating force which produces action.

The other day a school administrator, in discussing this problem, said: "You know, that reminds me of something I haven't thought of for years. When I was in grammar school, my sister brought home a cryptic note from school saying she needed glasses. My father simply ignored it. A few days later I brought home a note which stated the same thing. My father only laughed and said, 'The school people don't know what they are talking about; you don't need any glasses.' A few weeks later we went to a baseball game together. The game was under way when we arrived, and as we settled ourselves in our seats, my father asked the score. When I looked over to the scoreboard all I could see was a blur. So I told him I didn't know what the score was. He said 'Look at the scoreboard and see.' I had to confess I couldn't see the numbers. The next day my sister and I got glasses."

DISCOVER TEACHABLE MOMENTS IN THE CHILD'S DAILY LIFE

Must we always have to wait for a war or some other compelling but fortuitous event to capture the interest of children and to vitalize our health teaching? As long as health education is thought of in terms of formal health instruction, rich opportunities for

* Based on talk given at Wartime Conference on School Health Education, Hartford, Conn., January 18, 1944.

health education in school are lost. The school medical examination, vision testing of all children at periodic intervals, the luncheons children eat in school, and their many other activities have great educational value. They create attitudes; influence behavior; and leave, in most instances, lasting impressions because they are real life situations. They are teachable moments, and for the most part, we make no use of them in health education. Would many more youths have solved their medical problems long before the Victory Corps program if their previous school medical examinations had been planned as a real and vital experience? We know only too well the kind of school medical examination many of them experienced. They came through it like the boys in the Biblical story who passed through the fiery furnace—untouched! Certainly if the purpose of health education is to develop individuals whose knowledge and attitudes govern their daily living, then our most urgent task as health educators is to study opportunities in the school as well as in the child's out-of-school time to identify the teachable moments and see that they have positive value. This is not a new idea. But it has not yet influenced our school health procedures. The things we do to children and the things we endeavor to teach them in matters of health are for the most part unrelated. The classic and oftenquoted illustration is the emphasis put on teaching hand washing in the schools, but not providing the children with facilities for hand washing in the school.

EDUCATIONAL IMPLICATIONS OF THE SCHOOL MEDICAL EXAMINATION

The educational implications of the medical examination are perhaps most evident. Yet there is an appalling waste of opportunity for health teaching in the hundreds of thousands of routine school medical examinations performed in our schools every year. In spite of efforts to improve the quality of the school medical examination, in too many communities it still has only an imperceptible, positive current of health education, and in some places, the examination carries with it a highly shocking negative charge. Our children as a rule do not lack for medical examinations, but we fail to educate effectively in the process.

These are bad times to talk about improving the school medical examination. But it must be thought about and planned for now; otherwise, in 1960 we shall still be making speeches about the deplorable health of our youth as revealed by Selective Service examinations.

Suppose we could plan a school medical examination which would be an integral part of the child's education; how should we go about it? The impression made on child and parent in the course of giving the examination is most important. The educational and psychological effect of the school physician's and nurse's contact with the child is fundamental and obvious. One might think it unquestionably a conscious part of the school medical examination. Unfortunately, this is an essential part which has often been neglected. So much emphasis has been placed on finding defects that the child himself is overlooked. The late MacFee Campbell said that "the real child is more than an assemblage of organs plus a receptacle for school information. He is a complex bundle of highly organized instincts, emotions, and attitudes, and attention to these attitudes is more important than attention to his teeth."

PREPARATION IS NECESSARY

To make a favorable impression on the child and his parents, planning is necessary. The teacher, the nurse, and

the physician must understand the educational objective. Following are some of the ways this objective can be attained.

1. The teacher can discuss with the classroom the medical examination to prepare the younger children for their meeting with the doctor as a happy experience, and the older ones to ask questions, and to be prepared to act on any findings.
2. Where measuring of height and weight and vision testing are part of the classroom teacher's activities, these can be incorporated into her regular instruction.
3. Older children may assist with the testing procedures.
4. When the nurse does these tests, they should be discussed and interpreted to the teacher.
5. The nurse may furnish material which would be helpful in a classroom discussion of growth, seeing, and hearing.
6. A parents' meeting early in the school year may give the physician or nurse the opportunity to discuss the health service.
7. Parents should receive a special invitation to be present at the school examination. They should be informed of the date well in advance so they can plan to come. It will be necessary probably to send them a reminder the day before the event. The value of the parent being present is so obvious I do not think I need to elaborate.

MAKING THE EXAMINATION A TEACHABLE MOMENT

There should be a reasonable amount of privacy for the examination done at the school; the parent should have a definite appointment so as not to be kept waiting too long; doctor and nurse should be pleasant, and the child should be spoken to by his first name. These details may seem trivial, but they are essential, and they pay dividends in health education. Even today, when so many mothers are working, the attendance of mothers continues to be astonishingly high where attention has been paid to these details.

The examination should not only acquaint the mother with the significance of the defects found, and direct her on the pathway to treatment, but also give the mother of the healthy child satisfaction and information. The physician may give advice on the child's diet, or hours of rest and study, or discuss the signs of a communicable disease which may be prevalent; or explain why it is important to keep a child at home when he shows the first signs of a cold; or give information and guidance on many other health matters. This face-to-face discussion with the physician, whether in school or private office, is both a rare and unequalled opportunity for health education.

The greatest good the young child may derive from the medical examination is a satisfying experience. By a patient, gentle manner, avoidance of threats or comments which create concern or confusion, and by telling each child something about his physical condition of which he can be proud, the physician will create in the child's mind a favorable impression of the examination. For older children, especially at the secondary school level, an explanation by the doctor of his findings and answering of questions, may equal in value the conference with the mothers of younger children.

The school medical examination is the occasion when the accepted medical authority can bring his influence to bear for good or ill. His influence operates through the manner in which he conducts himself with the child and parent, and by his interpretation of the results of the examination. The right approach can make the examination the cornerstone in the school health education program. It is only occasionally that the school medical examination *per se* makes a contribution to the child. It is what the child and his family *learn* from it that has long-term value.

TEACHER PARTICIPATION IN A MEDICAL EXAMINATION

The full educational implication of the medical examination will not be

realized unless the teacher can be made aware of the findings. A common method is to place a check mark on the academic record opposite the name of the part of the body which the doctor finds defective. Another way is to send the teacher a simple statement of the condition of each child and what she can do about any defects found. It would be ideal if the physician could talk with the teacher about his findings. Teachers should be given the opportunity occasionally to observe the school medical examination. This is necessary if the teacher is to have sufficient understanding of the procedure to prepare children for it through classroom instruction. In some schools, the physician has an occasional conference with teachers to exchange information. The school nurse can do this and does in many schools where there is very little school medical service. Through these contacts, the school doctor and nurse get valuable insight into the daily behavior of children, and the teacher gets information for health instruction and observation.

COÖPORATION BETWEEN EDUCATIONAL AND HEALTH GROUPS NECESSARY

Many may think that the program just described is impractical and beyond our means. We must not let present difficulties with respect to medical and nursing personnel cloud our vision of the future. We must think now about our child health services of tomorrow. They call for better understanding on the part of all those concerned with the school medical examination. They call particularly for local medical interest and leadership. Physicians are making some progress along these lines. The Academy of Pediatrics since 1941 has advocated this approach in the school examination.[1] Its Committee on School Health recently made recommendations which might guide boards of education in the selection of well qualified physicians for school health service.[2] The American Public Health Association has recently approved a report on the Educational Qualifications of School Physicians, prepared by its Committee on Professional Education.[3] Some state and county medical societies have recently given special attention to the school health program. The American Public Health Association last year organized a School Health Section. All these developments are promising. The medical and public health workers have a contribution to make in this area of school health. Likewise, they have much to learn from the educator about the educational values in the service they render. I am convinced that joint planning will result in vastly more effective medical examinations of the school child.

EDUCATIONAL IMPLICATIONS OF THE SCHOOL LUNCH

The war has given a new impetus to nutrition education. The school lunch offers perhaps the best real-life situation for nutrition education. This experience in the school can be the basis for life-long good eating habits. Moreover, if the school lunch program is approached from the point of view of its educational value, it can be an important factor in influencing the eating habits of the whole family. As in the medical examination, we have an opportunity to use a dynamic and realistic activity to develop habits, attitudes, and appreciations that can function outside of school. Whether a single supplementary dish or a complete meal is served, pupils may be given realistic experiences in selecting, preparing, buying, and selling foods. They may figure what foods may be served at a given price, and learn which offer the greatest nutritional value. They may consider the advantages and disadvantages of purchasing different quantities,

or share in deciding whether candies, carbonated drinks, cookies, and the like, are to be placed on sale. They will learn how wartime shortages affect the planning of the school lunch, and how they may assist in the war effort by preventing waste of foods and fats. They should become increasingly aware of all the problems that must be met in running the lunchroom, especially those which have to do with the nutritional needs of pupils. And, most important, children should learn to eat good food, and that requires good cooking.

DEVELOPING HOME AND SCHOOL COÖPERATION

Nutrition education, like the school medical examination, contains opportunities from which the family as well as the child can learn. The importance of including the family in our health education program was clearly revealed in that noteworthy study made by the New York State Department of Education of the everyday behavior of elementary school children.[4] They found that, "If conflicts are to be avoided, no single groups, but all concerned, must work together to create an environment in which children can develop habits of work, play, and self-care, and have ample opportunity to practise them with satisfaction. This necessitates the participation of parents in the school program, and of teachers in the home program, as well as a community consciousness on the part of all." To work coöperatively with parents on the food and nutrition problems of their pupils, teachers need to become acquainted with parents—in their homes if possible—and also to keep them informed of what the children are learning. Whenever possible, in connection with every nutrition activity, it should be planned for the children to explain it to their parents, not only for the sake of keeping them informed, but because the experience of explaining the studies to them helps to reinforce what the child has learned, and motivates further learning on the same subject. On occasion, mothers should be invited to visit the school to see demonstrations, and hear talks by the children, summarizing what they have learned in relation to nutrition.

FOR MORE MEANINGFUL HEALTH EDUCATION

I have used the school medical examination and the school lunch merely to illustrate their educational implications. There are similar opportunities for health teaching in other phases of the child's school, home, and community life. Children's needs, both of the "felt" variety, and those which also exist but of which children may be unaware, are the richest source. The medical examination, as we have said, can reveal some. But those in daily contact with children—parents, teachers, nurses—are best able to discover these needs by closer study of our children's daily lives. Their sleep and rest, their play and work, their food and eating habits, their manifestations of fatigue and mental health, are the substance of more meaningful health education. We must make this study if we are to teach health, so that, for the individual, health becomes an instrument or means for more effective living. And, finally, to succeed, we must learn how to enter children's lives. This means we must give more attention not only to what they do, but what they say, what they listen to; what they read; and what they write. We must learn to meet them on their own terms.

Today even a casual observation reveals situations calling for more effective health education in the lives of children as well as of their parents. Most children are getting less home supervision. Home accidents, especially to young children, are on the rise.

Some, living in strange and new communities under crowded and squalid conditions, are being neglected because of the absence of mothers on war jobs. Some already are orphaned as war casualties mount. Other children are burdened prematurely with work too heavy for their strength, and thousands are laying aside their school books to take full-time jobs. Venereal disease and tuberculosis have increased in the 15–17 year old group during the war period. The following accounts,[5] written by high school students who worked during the summer months, illustrate some of the health and safety factors that enter into the work experience of young people:

"Last summer while I was working in a defense plant there were several things I did for personal safety and keeping physically fit.

"I worked in the mailing department as messenger and mail girl. I was constantly on the go, taking mail and telegrams on my route through the office and in the factory. While in the factory, the main thing I kept in mind was alertness at all times. Even though the electric trucks, which carry parts of machinery from one place to another, are in skillful hands, fatal accidents have happened.

"Comfortable shoes were a necessity on this job. The girls who wore high heels were usually very uncomfortable at the end of the day.

"Another thing I found out early in the summer, was that I couldn't sacrifice my sleep for shows and reading books. I found, if I went to sleep by 10 o'clock and got up by 6:30, I could do double my work if I had to, and there were days I did have to because of an absence.

"There was no shirking on lunches, either. In order to keep going until the end of the day I had to eat a good stable meal at lunchtime and a good-sized breakfast. My dinners were more on the light side. We had salads and fruits because of the warm weather.

"Regularities played a big part in my activities during the summer. I found I always felt fine and working seemed to be good for me mentally and physically."

Another high school student mentioned the long hours and insufficient food in her farm experience. Her account indicates the need for better supervision of the student workers on farms:

"I worked on various farms this summer for three weeks. We usually went to bed very early (8:30 or 9:00), as we had to get up at 6 A.M. We found that going to bed late made getting up early very difficult. There was not much time for recreation, except on our day off, and I think we would have enjoyed working much more if we had had more free time.

"The food was rather poor. The only two things we really had enough of were bread and milk. I don't think I saw an orange more than five or six times altogether.

"There were no extra precautions taken against accidents, other than those we ourselves had enough sense to take, and no one seemed to care whether we were sick or well."

SUMMARY

This war offers an opportunity and a challenge to health educators. The challenge is to use this opportunity to discover: (1) how and why people learn; (2) to improve our methods and technics in health education. In war or peace, too frequently some other factor, not employed in our health education technic, provides the spark.

This riddle of learning may be uncovered by studying the child's twenty-four hour day. The child's eating and sleeping, his work and play, his habits of cleanliness and rest—in short, what he thinks and what he does—all those elements which govern the child's daily living should be searched for teachable moments. Need for this kind of educational approach is greater than ever today because of part-time employment, juvenile delinquency, the lessened stability, and the greater tensions in children's lives. Health education should have its roots in the child's dynamic experiences in the school, the home, and the community.

The school medical examination and the school lunch are two real-life situations which have rich educational impli-

cations. To achieve these values in the medical examination, physician, nurse, and teacher must plan the procedure as a learning experience for the child and the parent, who should attend the examination. The school lunch, complicated as its administration is today, has important opportunities for health education. The nutrition program can link the school and community with the home. If we are to create an environment in which children can develop habits of work, play, and self-care, and have ample opportunity to practise them with satisfaction now as well as in later life, it is necessary for parents to participate in the school program, teachers in the home program, and there must be a community consciousness on the part of all.

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Public Health Degrees and Certificates Granted in the United States and Canada During the Academic Year 1943-1944*

THE Committee on Professional Education of the American Public Health Association presents a report of public health degrees and certificates granted in the academic year 1943–1944. In addition, a summary of enrollments and degrees granted in the last five years is given. With the exception of public health nursing tables, the committee has included only graduate students enrolled in courses leading to graduate degrees and certificates. The basis for the record is the number of *students who received degrees* rather than the number of degrees granted in the specified period.

Graduate Students Enrolled and Graduate Degrees Granted in Public Health Engineering and Sanitary Engineering Courses in the Academic Year 1943–1944

TABLE 1

Name of University	*Total Number of Graduate Students Registered*	*Graduate Degrees Offered*	*Number of Students Receiving Each Degree*
Agricultural & Mechanical College of Texas	6 [1]	Ph.D.	2
		M.S.	0
Cornell University	2	M.C.E.	1
Harvard University	20	Sc.D.	0
		M.S.	12
Johns Hopkins University	1	Dr.Eng.	2
		M.C.E.	1
Massachusetts Institute of Technology	2	Ph.D.	0
		Dr.P.H.	0
		Sc.D.	0
		S.M.	0
New York University	5	Dr.Eng.Sc.	0
		M.C.E.	3
Rutgers University	0	Ph.D.	0
		M.Sc.	0
Stanford University	0	Eng. in C.E.: San.	0
		M.A. in C.E.: San.	0
University of Alabama	0	M.S. in P.H.E.	0
		M.S. in S.E.	0

[1] Includes four students registered for part-time work.

* For previous reports see *A.J.P.H.*, Vol. 33, p. 1430; Vol. 32, p. 1360; Vol. 31, p. 1306; Vol. 30, p. 1456; Vol. 29, p. 1338; Vol. 28, p. 863; Vol. 27, p. 1267; Vol. 26, p. 819; Vol. 25, p. 341; Vol. 23, p. 1124.

TABLE 1 (Cont.)

Name of University	*Total Number of Graduate Students Registered*	*Graduate Degrees Offered*	*Number of Students Receiving Each Degree*
University of California	1	M.S.	1
University of Illinois	1	Ph.D. (San.Eng.)	0
		M.S. (San.Eng.)	0
University of Iowa	4 [2]	Ph.D.	0
		M.S.	0
University of Michigan	14	M.P.H.	0
		M.S.P.H.E.	4
		M.S.P.H.	2
University of Minnesota	1	Ph.D. (P.H. & Prev. Med.)	0
		M.P.H.	1
		M.S.P.H.	0
		M.S.C.E. (San. Eng.)	0
		M.S.P.M. & P.H.[3]	1
University of North Carolina	7	M.S. in S.E.	1
		M.S.P.H.	4
University of Toronto	0	M.A.Sc.	0
West Virginia University	0	M.S.C.E. (San. option)	0
	64		35

[2] Includes three special Graduate Students under A.S.T.P.
[3] Master of Science in Preventive Medicine and Public Health

Classification of Graduate Engineering Degrees Granted in the Academic Year 1943–1944

TABLE 2

Degree	*Number of Students Receiving Degrees*	*Number of Schools Offering Each Degree*
Doctor of Philosophy	0	6
Doctor of Public Health	0	1
Doctor of Engineering	2	1
Doctor of Science	0	2
Doctor of Engineering Science	0	1
Master of Public Health	1	2
Master of Science in Public Health	6	3
Master of Science in Preventive Medicine and Public Health	1	1
Master of Science in Public Health Engineering	4	2
Master of Science in Sanitary Engineering	1	2
Master of Science in Civil Engineering	0	2
Master of Science	15	7
Master of Civil Engineering	5	3
Engineer in Civil Engineering	0	1
Master of Arts in Science	0	1
Master of Arts in Civil Engineering	0	1
	35	

Enrollment in Public Health Courses and Degrees and Certificates Granted in the Academic Year 1943–1944

(Exclusive of Engineering and Nursing Students)

Number of graduate students enrolled and public health degrees and certificates conferred during the academic year 1943–1944 by United States and Canadian Universities. The professional background of the students is given where known.

TABLE 3

Name of Institution	*Total Number of Graduate Students Registered*	*Physicians*	*Dentists*	*Health Educators*	*Public Health Laboratory Workers*	*Statisticians*	*Nutritionists*	*Teachers*	*Epidemiologists*	*Nurses*	*Public Health Engineers*	*Sanitarians*	*Industrial Hygienists*	*Unclassified*	*Graduate Degrees and Certificates Offered*	*Number of Students Receiving Each Degree or Certificate*
DeLamar Institute of Public Health, Columbia University	17	13	3	..	..	1	..	..	..	..	..	..	..	..	Dr.P.H. M.S.P.H.	0 15
Harvard School of Public Health	40[1]	20	2	2	..	1	11	..	..	4	..	..	.	..	Dr.P.H. M.P.H.	0 19
Johns Hopkins University	49	30	..	..	14	..	..	1	.	2	2	..	..	..	Dr.P.H. M.P.H. Sc.D. in Hyg. Sc.M. in Hyg.	3 32 3 3
Loyola University	6	1	..	..	1	..	..	2	..	..	.	2	..	..	M.S.P.H.	1
Massachusetts Institute of Technology	16	..	..	8	8	..	..	..	..	..	..	..	..	..	Dr.P.H. M.P.H. C.P.H.	3 8 5
McGill University	0	..	..	..	..	..	..	..	..	..	..	..	..	..	D.P.H.[2] D.V.P.H.[3]	0 0
State College of Washington	0	..	..	..	..	..	..	..	..	..	..	..	..	..	C.P.H.	0
University of California	20	..	..	15	1	3	..	1	..	..	..	..	..	..	Dr.P.H. M.A.	0 1
University of Kentucky	4	..	..	2	1	..	..	..	..	..	..	..	..	1	M.S.P.H.	0
University of Michigan	54	14	3	22	3	4	..	..	1	..	..	..	2	5	Dr.P.H. M.P.H. M.S.P.H.	3 30 1

[1] In addition there were 12 part-time students not working toward degrees
[2] Diploma in Public Health
[3] Diploma in Veterinary Public Health

TABLE 3 (Cont.)

Name of Institution	Total Number of Graduate Students Registered	Physicians	Dentists	Health Educators	Public Health Laboratory Workers	Statisticians	Nutritionists	Teachers	Epidemiologists	Nurses	Public Health Engineers	Sanitarians	Industrial Hygienists	Unclassified	Graduate Degrees and Certificates Offered	Number of Students Receiving Each Degree or Certificate
University of Minnesota	4	..	..	2	..	2	..	..	..	..	..	..	..	..	Ph.D. M.P.H. M.S. M.A.	0 0 0 0
University of North Carolina	54	3	..	43	3	..	..	..	..	2	..	3	..	..	Ph.D. Dr.P.H. M.P.H. M.S.P.H. C.P.H.	0 0 3 22 0
University of Pennsylvania	27	22	3	2	..	..	..	..	..	..	..	..	..	..	Ph.D. M.P.H. M.S.	0 1 0
University of Puerto Rico, School of Tropical Medicine	22	..	..	..	11	..	..	..	..	..	..	11	..	..	C.M.T.[4] M.Sc. (San.)	12 11
University of Toronto	35	19	1	..	15	..	..	..	..	..	..	..	..	..	Ph.D. D.P.H.[2] D.I.H.[5] M.A. B.Sc. (Dent.)[6]	3 18 0 2 0
Vanderbilt University	0	..	..	..	..	..	..	..	..	..	..	..	..	..	M.P.H.	0
Yale University	48	10	..	17	3	1	3	9	..	1	..	..	..	4	Ph.D. Dr.P.H. M.P.H.	0 1 7
Totals	396	132	12	113	60	12	14	13	1	9	2	16	2	10		207

[4] Certificate in Medical Technology
[5] Diploma in Industrial Hygiene
[6] In future to be known as Diploma in Public Health Dentistry

Classification of Public Health Degrees and Certificates Granted in the Academic Year 1943–1944

(Exclusive of Engineering and Nursing Degrees and Certificates)

TABLE 4

Degree or Certificate	*Number of Students Receiving Degrees or Certificates*	*Number of Schools Offering Each Degree or Certificate*
Doctor of Public Health	10	8
Doctor of Science	3	1
Doctor of Philosophy	3	5
Master of Public Health	100	9
Master of Science in Public Health	39	5
Master of Science	14	4
Master of Arts	3	3
Diploma in Public Health	18	2
Diploma in Veterinary Public Health	0	1
Diploma in Industrial Hygiene	0	1
Certificate in Public Health	5	3
Certificate in Medical Technology	12	1
Bachelor of Science (Dentistry)	0	1
Total	207	

Degrees and Certificates Granted in Public Health Nursing for the Year 1943–1944 in the 30 Universities Having Programs of Study Approved by the National Organization for Public Health Nursing

Table 5, below, indicates the number of students who received degrees or certificates for the academic year 1943–1944. These figures have been compiled by the National Organization for Public Health Nursing and are printed here with permission.

TABLE 5

	Number of Students Receiving Each Degree or Certificate			
Name of College or University	*Baccalaureate Degrees*	*Master's Degrees*	*Doctor's Degrees*	*Certificates* [1]
Catholic University of America	7	1	..	4 [2]
Columbia University	52	18	1	35 [2]
Duquesne University	5	..	..	7
George Peabody College for Teachers	29	4	..	39
Incarnate Word College	3	..	..	6 [2]
Indiana University	9	..	..	.. [2]
Loyola University	8	..	..	20
Marquette University	4	..	..	3
Medical College of Virginia	..	..	..	24 [3]
New York University	53	5	..	.. [2, 4]
St. John's University	6	..	..	6 [2]
St. Louis University	11	..	..	.. [2]
Seton Hall College	1	..	..	13 [2]
Simmons College	3	..	..	46
Syracuse University	7	..	..	20
University of Buffalo	6	..	..	2
University of California, Berkeley	9	..	..	18
University of California, Los Angeles	15	..	..	13
University of Chicago	2	..	..	.. [2]
University of Colorado	1	..	..	4
University of Michigan	7	1	..	25 [3]
University of Minnesota	80	2	..	7 [5]
University of North Carolina	2	2	..	19
University of Oregon	2	..	..	14
University of Pennsylvania	13	1	..	42 [2]
University of Pittsburgh	4	..	..	4 [2]
University of Washington, Seattle	6	2	..	23
Vanderbilt University	1	..	..	13 [2]
Wayne University	4	2	..	17
Western Reserve University	11	5	..	48
Totals	361	43	1	472

(Notes on page 1269)

[1] In all 30 universities the year's program of study in public health nursing approved by the N.O.P.H.N. is the major in a degree program. In 18 of the 30, a certificate is granted on completion of this major.

[2] These 12 universities do not grant certificates but the program of study in public health nursing which they offer is at least the equivalent of the certificate program.

[3] Beginning with the academic year 1944–45, certificates will no longer be granted in these two universities.

[4] Unable to estimate, since students do not take the program of study in one block.

[5] Only students who already have a B.S. degree are eligible for a certificate in public health nursing upon completion of the program of study.

Enrollments in Public Health Courses and Degrees and Certificates Granted in All Schools Covered by This Report in the Academic Years 1940–1944

TABLE 6

	Enrollment [1]		*Degrees and Certificates Granted*			
	Engineers	*Public Health (Other than Engineers and Nurses)*	*Engineers*	*Public Health (Other than Engineers and Nurses)*	*Nurses*	*Total*
1939–1940	131	550	66	331	976	1,373
1940–1941	130	645	59	332	949	1,340
1941–1942	163	466	89	269	719	1,077
1942–1943	64	323	24	159	874	1,057
1943–1944	64	396	35	207	877	1,119
Totals	552	2,380	273	1,298	4,395	5,966

[1] Data covering enrollment in courses for public health nurses are not available after 1941 and therefore have not been included in this summary.

Summary of Degrees and Certificates Granted During the 5 Year Period 1940–1944

The following table itemizes the public health degrees and certificates granted by the schools covered in this report for the academic years 1940–1944.

TABLE 7

	1939–1940	*1940–1941*	*1941–1942*	*1942–1943*	*1943–1944*	*Total*
Doctor of Public Health	19	20	12	7	10	68
Doctor of Science	8	7	17	1	3	36
Doctor of Philosophy	3	2	9	2	3	19
Doctor of Engineering	0	0	2	1	2	5
Doctor of Public Health Nursing	0	0	0	0	1	1
Master of Public Health	142	156	151	83	101	633
Master of Science in Public Health	74	90	73	19	45	301
Master of Science in Public Health Engineering	0	0	2	1	4	7
Master of Science in Sanitary Engineering	0	2	4	2	1	9
Master of Science in Civil Engineering	0	0	2	0	0	2
Master of Science in Engineering	0	0	1	0	0	1
Master of Science	79	47	28	13	29	196
Master of Civil Engineering	12	11	6	3	5	37
Master of Science in Preventive Medicine and Public Health	0	0	0	0	1	1
Master of Arts	0	1	1	0	3	5
Master of Arts in Science	0	0	3	1	0	4
Master's Degree (Nurses)	47	42	22	43	43	197
Diploma in Public Health	24	29	19	20	18	110
Diploma in Veterinary Public Health	0	5	0	0	0	5
Baccalaureate Degree (Nurses)	417	339	215	388	361	1,720
Certificate in Public Health	33	18	4	14	5	74
Certificate in Public Health Nursing	512	568	482	443	472	2,477
Certificate in Medical Technology	0	0	0	14	12	26
Engineer in Civil Engineering	3	3	0	2	0	8
Engineering Science and Management Defense Training Certificate	0	0	24	0	0	24
Totals	1,373	1,340	1,077	1,057	1,119	5,966

W. P. SHEPARD, M.D., *Chairman*

Seventy-five Years of Public Health in Massachusetts

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MILITARY historians tell us that the battle of Chickamauga just happened. This engagement, one of the bloodiest of the Civil War, was fought because the commanders of the northern and southern armies knew of the existence of springs of pure water there, but neither was aware of the nearness nor the intent of his adversary. In many ways sanitary considerations markedly altered the outcome of the war, and a tragic proportion of soldier deaths was due to diseases and infected wounds. The realization of the pressing need for improved sanitary services carried over from military experience to civil life.

Within five years of the close of the War Between the States, the Massachusetts Legislature had passed an act to establish a State Board of Health—the first in America. The act of 1869 directs that:

> The board shall take cognizance of the interests of health and life among the citizens of this Commonwealth. They shall make sanitary investigations and inquiries in respect to the people, the causes of disease, and especially of epidemics, and the sources of mortality and the effects of localities, employments, conditions and circumstances on the public health; and they shall gather such information in respect to those matters as they may deem proper, for diffusion among the people.

Considering the lack of scientific knowledge of that day, these broad authorizations have about them a surprisingly modern ring. Pasteur had disproved the older theories of spontaneous generation but his bacteriological discoveries still were concerned with diseases of wine and silkworms: they had yet to reach the realm of human health. Scientific thought was still cluttered with Pettenkofer's beliefs linking emanations from moist soil and tuberculosis. It was still the era of bad smells—"If anything is settled as to the causes of disease, it is the influence of decomposing organic matter in giving rise to . . . typhoid fever . . ." wrote the Secretary of the new Massachusetts Board.

The first annual report of this pioneering Board is so realistic that one can almost attend the inaugural meeting. The Governor had appointed the membership promptly. The senior appointee, Dr. Henry Ingersoll Bowditch, calls the members together. They are meeting in a committee room, for no quarters are provided. Fully conscious of the import of this unprecedented occasion and of the solemnity of the moment, Dr. Bowditch arises to read his charges to them:

> The law requires us to diffuse among our people any already established laws of public health, and also whatever we may hereafter discover on that subject. . . . How shall we diffuse this knowledge? . . . (a) By lectures from our Secretary or from members of the Board on various special subjects connected with public hygiene—such as ventilating, and

building, and location of houses; on various well-known diseases capable of partial or entire prevention on knowledge of causes being given. . . . (c) By the publication in a compact form and the wide circulation of the pith of our general knowledge on public hygiene. . . . (d) By our annual reports to the legislature, which, I trust, will always be models of brevity and of compact learning.

A week after this auspicious beginning, the Board came together again to adopt by-laws. At this meeting the following subjects were singled out for special investigation by the members: prevailing modes of slaughtering, sale of poisons, comparison of the sickness and mortality in different kinds of houses occupied by the poor. In addition, it was then and there decided to address a circular letter to the local boards of health about their powers and duties, and further to collect and publish the number and prevailing causes of deaths in the most populous cities and towns.

A PIONEERING DECADE

Throughout the first ten years of its existence, the members of the Massachusetts Board of Health carried on ingenious investigations concerning the nature of the sanitary problems confronting the state and the means which might be effected to remedy them. Merely the record of the activities of these inquiring minds is an inspiration to us in these settled times. One of the first subjects which attracted the attention of the Board was the method employed in slaughtering and the disposal of animal refuse in the nearby town of Brighton. Fifty-odd small companies carried on slaughtering, under sanitary conditions which beggared the descriptive powers of the not inarticulate investigators. The Board sought courageously to compel the erection of sanitary abattoirs which might mitigate the worst of the unspeakable nuisances. That the job needed doing, there was no question, but the members struggled with their consciences because they could find no evidence in the death records of Brighton to support their beliefs that the dreadful smells coming from the slaughter houses must be inimical to health.

Among their early activities, the Board subsidized the investigation of the sanitary condition of inland waters by the best qualified engineers of the day. Their reasonable interest in the pollution of ponds and streams used for potable water supplies was admixed with a curious concern about mill-dams and other obstructions which raised the water level of the surrounding soil, causing it to give forth noxious vapors and vague but insalubrious emanations.

As a practical means of ascertaining the state of the public health, the Board circularized the cities and towns asking that a physician be designated to act as a correspondent for the community. From the returns, conscientiously made, the Secretary ascertained not only the existence and nature of any epidemics, which the Board proposed to take steps to suppress, but the Board learned from the correspondents as well the prevailing opinions about the nature and causes of the diseases which plagued their communities. Though their democratic acceptance of majority opinion as medical gospel amuses us in these smug days of scientific research, one by-product of this correspondence was the beginning of a productive coöperation between the state and local health authorities.

This pioneering period was dominated throughout by Dr. Henry Ingersoll Bowditch, long an authority on consumption. In his sixtieth year and firm in the belief that, where ground is damp, consumption develops, he had at the same time the vision and the breadth of understanding to mold and direct all the variety of activities which then made up public health practice. After ten years his productive work was

ended by the unhappy amalgamation of health with lunacy and charity. In explaining his resignation in protest against this impractical act, Dr. Bowditch wrote:

> In 1878 came mutterings of political disaster to the ruling powers, and forebodings of what the renowned General Butler would do with the numerous "commissions" (that of health among them) that were "spending wastefully the people's money." Accordingly, to attack this redoubtable General upon his political "flank," the legislature, under suggestions from Governor Talbot, merged the three departments of Health, Lunacy, and Charity, a Cerebrus, in fact, in its grotesqueness of head. Three commissions, all different in ideas and modes of action, jumbled into one heterogeneous mass, simply because the ruling party feared the advent of power of a political adventurer! . . . At one time, for three or four successive meetings, nothing was done about sanitation, the time being occupied in discussions on lunacy and charity, on both of which subjects, so far as they had relation to the State, neither I nor my comrades on the old board knew anything.

Although public health languished when it was linked with such unrelated state activities, the investigation of streams and ponds continued and some sanitary progress was made. One compensation for the loss of this vigorous-minded pioneer was the emergence of a man of like caliber, Dr. Henry Pickering Walcott, who served first as health officer and later as chairman of the health subcommittee of the triple-functioned board. When the unfortunate union was ended and a new and greatly revitalized board appointed, Dr. Walcott was made its chairman, a position which he held for almost thirty years, until the Board was reorganized as a department.

THE "GOLDEN AGE" OF PUBLIC HEALTH

The phenomenal scientific advances following in the wake of the discoveries of Pasteur and Koch came to full-flowering in Massachusetts under Walcott's forceful leadership. Bowditch had pointed the way; Walcott built the solid foundation for effective public hygiene. He rallied about him young men who were to make Massachusetts the proving ground of health administration. Early in this productive period, an experiment station at Lawrence was established, and from it has come much of the world's knowledge of scientific water and sewage treatment. A laboratory was set up in co-operation with Harvard University for the production of antitoxins and vaccines which has supplied the state to this day with the means of saving lives and preventing epidemic diseases. Epidemiological procedures were inaugurated which are still used in controlling outbreaks of disease.

To implement the state-wide control of communicable diseases, regional inspectors of health were appointed to act as advisers of local boards of health, the first example of this extension of state service in our country. During this golden era many young men began their scientific careers in Massachusetts—a few to stay on to lead the several health services of the State Board, many more to go out to carry the torch to the nation. On the staff of the Board during this period will be found the illustrious names of Theobald Smith, Sedgwick, Rosenau, Goodnough, Hazen, Fuller, Stearns.

New times call for new methods. The varied administrative burden had become too great and the responsibility too heavy to be carried on the anonymous shoulders of a board, however capable the members might be. The needs of the day called for the creation of a responsible commissionership and, by the law of 1914, the old board was dissolved and a health department created to supersede it. Full of honors, Dr. Walcott retired.

DRAFT REVELATIONS CALL FOR NEW HEALTH SERVICES

Once again, in a time of crisis,

vigorous leadership was forthcoming. A surgeon of the U. S. Public Health Service, Allan J. McLaughlin, was assigned to be commissioner of the newly reorganized department. The council appointed to advise him was composed of competent and disinterested medical and lay members. The division heads were men of proved administrative ability. Providentially, there was thus brought together a working team competent to deal with the health needs startlingly revealed by the first World War draft. Under this wholesome influence, the Massachusetts Department of Health again pointed the way during, and following, the tumultuous days of the first World War.

After four productive years, Dr. McLaughlin was recalled by the Public Health Service to undertake a war assignment and Dr. Eugene R. Kelley, who had proved his mettle as Director of the Division of Communicable Diseases, was appointed to succeed him. After his untimely death, he was in turn succeeded by his deputy, the brilliant Dr. George H. Bigelow. Under these three dynamic men the department took on new functions and turned its face in new directions.

In addition to the classic interest in environmental sanitation and communicable disease control, new undertakings in personal and community hygiene were introduced by these men. The departmental program was broadened by the assumption of services for the prevention and treatment of tuberculosis, the addition of new specialties in maternal and child health, public health nursing, nutrition, and school and adult hygiene. During part of his working hours, the sanitary officer was induced to shed his badge of law enforcement in order to adopt the gentler rôle of guide and mentor. All the adventure of pioneering in public health was not yet gone.

This was the period of national economic ups and downs. It included a sharp but cruel post-war depression, the "permament prosperity" of the "twenties" and the debacle of the early "thirties" which was to give us social security, with its stimulus for adequate national health administration. To the states this meant federal grants for greatly enhanced programs in maternal and child health, crippled children, venereal diseases, and tuberculosis.

SELECTIVE SERVICE PROVIDES ANOTHER SAMPLING OF AMERICA'S HEALTH

The exigencies of a nation geared to war conditions have imposed upon state health departments generally many new and specific obligations. Among its other programs the Massachusetts agency is administering special case finding projects in tuberculosis, state-wide diagnostic and social services for cancer and other chronic conditions, applied nutritional and dental hygiene programs—services which may be far-reaching in their ultimate social consequences. Typical of these new activities is the Emergency Maternity and Infant Care Program which furnishes obstetric and pediatric services free for the wives of soldiers and sailors within certain pay grades, a medical care project under the supervision of the department.

Despite the complications which new activities inevitably entail, we find the Massachusetts Department seeking by the expansion and development of its district offices, and by means of demonstration, encouragement and supervision to strengthen rural and suburban health organization to the point where local boards themselves may meet their own obligations.

A Sponsored Epidemic of Mumps in a Private School

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AMONG the so-called contagious diseases of childhood, mumps has one quality peculiar to itself—that of being less severe in complications before puberty than after this period. Although occasional cases of mumps encephalitis are encountered among children, other complications such as orchitis, ovaritis, and pancreatitis are rarely seen under 12 years of age.

From a public health and especially from a military standpoint, the problem of preventing mumps is of great importance, for, next to venereal diseases, mumps is reported as the most disabling of all acute infections among army recruits.[1] During the first World War, nearly 4,000,000 man days were lost from duty in the U. S. Army because of this disease.[2]

It might seem reasonable, therefore, in view of these facts and figures, to attempt to expose children to cases of active mumps in order that they might develop an immunity prior to the onset of adolescence.

The present paper reports the results of such an attempt in a private school of 161 children during the mumps epidemic in New York City in the early months of 1942. This school * had for the twelve previous years been remarkably free from mumps. On a number of occasions the spread had been prevented either by isolation of exposed children or by partial quarantining of the class, viz.: treating the class as an isolated unit in school, and isolation from other schoolmates before and after school hours. As a result of these procedures only a very few children in the graduating classes gave a history of having had mumps, whereas many cases developed among graduates while attending high school or college.

On January 22, 1942, one of the children (E.S.) developed mumps, exposing not only those in her own class (Group VIII)* but also her brother and two other children from Group XI who were visiting at her home. Four days later (January 26, 1942) another child (H.M.) in Group VIII also developed mumps, not only reëxposing the class but exposing a brother in Group IX, a friend in Group IX, and another brother in Group XI.

Under usual routine methods Group VIII would have been kept as a unit in the school, coming late and leaving early, and remaining isolated from other children in the school. The other 6 known exposed children would have been withheld from school until the period of incubation was over.

However, the following letter was sent immediately to all parents:

* City and County School, New York City

* The children at the City and Country School are grouped by ages (i.e. all 8 year olds are in Group VIII, etc.).

Dear Parents:

At the present moment there are a number of cases of mumps in the school. Several of the children have brothers or sisters in other classes not exposed.

With all other contagious diseases our policy is to exclude these children exposed at home to avoid further possibility of contagion.

However, since mumps is an extremely mild disease and almost devoid of any complications before puberty, and may be at times very painful and result in serious complications after puberty, I feel it would be inadvisable to do anything to avoid exposure to this disease, unless there is a particular reason.

We would like to know if you and your child's physician are in agreement.

This letter brought forth the unanimous approval of the parents, with only one questioning note from a pediatrician who felt that no child should ever knowingly be exposed to a disease, but consenting to the plan if most of the parents agreed.

Accordingly, no restrictions were placed on exposed children, with the exception of the classes of children aged 3, 4, and 5 years. Within 3 weeks, 14 cases of mumps had developed in 5 different classes, 12 of which were directly traced to the two children with the original infections.

The spread continued and within a period of 3 months 62 children (54.4 per cent) from a total of 114 susceptibles in the upper 8 classes developed the disease. Four children in the lower 3 classes contracted the disease from their brothers or sisters. These children were excluded from their classes during the incubation period and no further cases resulted. The distribution of infection in the various classes is shown in Table 1.

Of the 66 children who developed the disease, 6 developed complications. The first two generations of the infection were mild and all 16 cases recovered without complication.

However, in the third generation of 18 cases there was 1 case of mumps encephalitis, and in the fourth generation of 19 cases there were 3 cases of mumps encephalitis. Two of the children who developed encephalitis received spinal taps as corroborative evidence, although all four suffered severe headaches, vomiting, and neck rigidity at the end of the first week. The parents of the children developing mumps encephalitis were reassured that there would be no aftereffects.*

Two other complications which developed were a moderately severe orchitis in a boy, aged 12, and a possible pancreatitis in a child of 8 years.

When the epidemic subsided in April, 1942, a questionnaire was sent out requesting complete information on the children who contracted the disease, with an added question as to whether any other members of the family contracted the disease. The final analysis revealed that beside one teacher, who was incapacitated with the disease for 2 weeks, 10 parents suffered from the infection, a possibility which was completely overlooked when the plan was suggested.

It is doubtful if any further epidemics will be sponsored by the school.

TABLE 1

Group	*Susceptible Children*	*Developed Mumps*
III	12	2 *
IV	11	1 *
V	11	1 *
VI	14	7
VII	17	10
VIII	16	8
IX	15	9
X	11	6
XI	14	9
XII	15	9
XIII	12	4
Total	148	66

* These 4 cases were exposed to brothers and sisters in higher classes They were withheld from school during the incubation period, thus preventing further spread in their classes.

* This opinion was corroborated by consultation with Dr Josephine Neal of the New York City Department of Health.

SUMMARY

1. With the consent of the parents, a mumps epidemic which could have been limited was sponsored in a private school of 161 children.

2. Out of 114 susceptible children exposed, 62 contracted the disease within a period of 3 months.

3. Of the 62 children developing mumps, there were 6 who developed complications. There were 4 cases of mumps encephalitis, 1 case of orchitis, and 1 with a probable mild pancreatitis.

4. One teacher and 10 parents also developed mumps.

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Salmonella Types Isolated in Georgia in 1941-1943, Including a New Type—Salmonella georgia

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AN increasing number of *Salmonella* strains is being isolated in the laboratories of the Georgia Department of Public Health. In the 3 year period, 1938–1940, our laboratories made only 47 isolations of *Salmonella* organisms from blood and stool cultures. During the succeeding 3 years, 1941–1943, 130 isolations were made. This increase is probably due to more efficient methods of isolation and identification rather than to an increase in incidence of the infections.

Bismuth sulfite agar and Bacto- SS agar for plating, tetrathionate broth for enrichment, and Kligler's iron agar for colony differentiation, have proved a satisfactory combination of media for isolating the organisms. A fairly adequate assortment of group and specific antisera further facilitates identification. However, for the past 3 years most of our strains have been either identified or confirmed by the New York Salmonella Center, Beth Israel Hospital, New York, N. Y. During this time 20 different types have been encountered, including a new type.

TABLE 1

Salmonella Types Isolated in Georgia During 1941–1943

Group	*Type*	*1941*	*1942*	*1943*	*Total No. Isolations*	*Total No. Individuals*
A	*S. paratyphi A*	1	1	4	6	4
B	*S. paratyphi B*	5	8	20	33	22
	S. typhimurium	0	14	10	24	18
	S. derby	0	2	1	3	3
	S. bredeney	0	1	0	1	1
C	*S. choleraesuis*	2	6	5	13	13
	S. oranienburg	1	3	6	10	7
	S. bareilly	1	0	0	1	1
	S. montevideo	1	3	2	6	6
	S. tennessee	0	0	2	2	1
	S. georgia	0	0	1	1	1
	S. newport	1	1	0	2	2
	S. muenchen	0	0	3	3	1
	S. litchfield	0	1	0	1	1
D	*S. sendai*	1	0	0	1	1
	S. panama	1	0	9	10	3
E	*S. give*	0	1	0	1	1
	S. anatum	0	2	5	7	7
	S. meleagridis	0	1	1	2	2
Other	*S. poona*	0	0	3	3	2
Totals		14	44	72	130	97

Some types were isolated only once while others occurred more frequently. *Salmonella bredeney, S. bareilly, S. georgia, S. litchfield, S. sendai,* and *S. give* were each represented by a single isolation from only 1 patient. *S. tennessee* was isolated twice from 1 patient, and *S. muenchen* 3 times from another. *S. paratyphi B, S. typhimurium,* and *S. choleraesuis* accounted for 53.8 per cent of all isolations. A list of the types found in this state during 1941–1943 is presented in Table 1.

S. paratyphi B and *S. choleraesuis* were found in 59 per cent of the blood cultures. One strain of *S. choleraesuis* was isolated from pus from the knee. A combination of *S. typhi* and *S. montevideo* occurred in a 3 year old child. *S. typhi* was recovered from the first stool culture. From a second specimen received 5 days later, both *S. typhi* and *S. monevideo* were isolated. Table 2 shows the distribution of types in blood and stool cultures.

There have been very few instances in which relationship between the cases could be established. One outbreak of food infection due to *S. typhimurium* occurred in an institution for boys. There were about 40 patients who had symptoms of fever, vomiting, and diarrhea. Unfortunately, the peak of the epidemic had passed before the laboratory was called upon for assistance. Stool specimens were received from only 6 patients and *S. typhimurium* was isolated from 4. Four *S. paratyphi B* infections occurred in the staff personnel of a small hospital. The first case, a nurse, was proved by a positive blood culture. About 2 months later 2 other nurses became ill with nausea, vomiting, diarrhea, and temperature elevation to 103° F. No blood or stool cultures were made at the time. Later, the chief physician was taken ill with about the same symptoms, and a blood culture was positive. Epidemiological investigation indicated that the only source of food common to the physician and nurses was milk and cream. A milker in the dairy that supplied milk to the hospital was found to

TABLE 2

Salmonella Types Isolated from Blood and Stool Cultures

Group	*Type*	*Blood*	*Stool*	*Total No. Isolations*
A	*S. paratyphi A*	6	0	6
B	*S. paratyphi B*	17	16	33
	S. typhimurium	1	23	24
	S. derby	0	3	3
	S. bredeney	1	0	1
C	*S. choleraesuis*	9 *	4	13
	S. oranienburg	5	5	10
	S. bareilly	0	1	1
	S. montevideo	1	5	6
	S. tennessee	1	1	2
	S. georgia	0	1	1
	S. newport	0	2	2
	S. muenchen	0	3	3
	S. litchfield	0	1	1
D	*S. sendai*	1	0	1
	S. panama	2	8	10
E	*S. give*	0	1	1
	S. anatum	0	7	7
	S. meleagridis	0	2	2
Other	*S. poona*	0	3	3
Totals		41	86	130

* One isolation was made from pus from knee.

be a carrier of *S. paratyphi B*. Two cases due to *S. panama* occurred simultaneously in adjoining homes. There were 2 cases due to *S. anatum* in 1 home, the mother and daughter being ill at the same time.

S. typhimurium, S. derby, S. bareilly, S. oranienburg, S. litchfield, S. give and *S. anatum* were isolated from feces in routine food handler examinations.

The new type, designated as *S. georgia*, was isolated from the feces culture of a 16 year old white boy during a routine examination of food handlers. The boy apparently was a healthy carrier. The organism was identified by the New York Salmonella Center and confirmed by Dr. P. R. Edwards of the National Salmonella Center, Lexington, Ky. It has the antigenic formula VI, VII: b–e,n,z_{15}.

SUMMARY

During the 3 year period, 1941–1943, 20 types of *Salmonella* organisms were isolated from blood and stool specimens. Of 130 isolations, *S. paratyphi B, S. typhimurium*, and *S. choleraesuis* accounted for 53.8 per cent. *S. paratyphi B* and *S. choleraesuis* were found in 59 per cent of the 44 positive blood cultures.

A new type, isolated from the stool of a normal food handler, has the antigenic formula VI, VII: b–e,n,z_{15}, and has been designated as *S. georgia*.

Isolation of Shigella paradysenteriae Type P288 of Boyd from a Case of Acute Diarrhea

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DURING June, 1944, several cases of acute diarrhea occurred among trainees at a naval training school for WAVES located in Georgia. All patients had temperatures of 102–103° F., profuse watery stools, abdominal cramps and prostration. The duration of illness was 3 to 4 days. Fecal specimens from only 2 patients were submitted for culturing. From 1 of these was isolated an organism identified as *Shigella paradysenteriae* P288,* a type described by Boyd [1, 2] as occurring in India. This isolation, to our knowledge, is the first to be reported in this country.

The incitants of bacillary dysentery comprise a group of Gram-negative bacilli having diverse characters and a study of both biochemical and serological properties is essential to their identification. Boyd [1–4] has made valuable contributions to the study of dysentery bacilli and has shown the Flexner group to be of complex antigenic structure. An analysis by Boyd [2] of the antigenic structure of 4,856 strains of

* Identification was confirmed by Dr. A. J. Weil, Lederle Laboratories, Inc., Pearl River, N. Y., and by Dr. K. M. Wheeler, Connecticut State Department of Health Laboratories, Hartford, Conn.

" mannitol-fermenting bacilli (except late fermenters of lactose and sucrose) isolated in military laboratories in India in the years 1932–1935 " revealed a number of strains which gave the biochemical reactions of the Flexner species but which were antigenically different. This atypical group was subdivided into several distinct types, one of which was designated as P288. According to Boyd [2] and to Wheeler [5] P288 has a specific antigen and very little if any Flexner group antigen. Boyd [4] states that " P288 . . . is very definitely a true dysentery bacillus."

P288 cannot be distinguished from other members of the *Shigella paradysenteriae* group except by serological reactions. The organism isolated by us fermented dextrose, mannite, and arabinose and gave negative reactions with lactose, sucrose, salicin, adonitol, dulcitol, xylose, and sorbitol. Trehalose and maltose showed delayed reactions. Indole was not produced. The organism was agglutinated by P288 antiserum only.

Of the 4,856 strains studied by Boyd,[2] 64, or 1.3 per cent, were type P288. In 1936 Wilson [6] reported a small outbreak of dysentery due to P288 which occurred in the Indian platoon of a British regiment in Burma. Ten cases occurred, and P288 was isolated from all 10. Although, so far as we know, the case described here is the first to be reported in this country, a critical study of the antigenic structure of so-called " inagglutinable Flexner " strains may show this type of Shigella to be more prevalent than has heretofore been suspected.

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American Journal of Public Health
and THE NATION'S HEALTH

Official Monthly Publication of the American Public Health Association

Volume 34 December, 1944 Number 12

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LAURELS FOR MASSACHUSETTS

THE sixth of December is a day of celebration for public health workers in Boston; and it is a day of significance for the movement throughout the United States. The Massachusetts State Department of Health on that date commemorates the 75th anniversary of the department, and the 50th anniversary of the establishment of its State Antitoxin Laboratories.[1]

Only New York City can perhaps compare with the State of Massachusetts in the significance of its historical contributions to the cause of public health on our continent. This " Commonwealth " established in 1869 not only the first of our state health departments in point of time but—for many decades—the first in point of quality. Chapin's survey of 1915 scored Massachusetts 745 and New York (the next state in rank) 730. Massachusetts still stands among the top health departments of the United States.

The establishment of the Lawrence Experiment Station in 1886 laid the basis for all modern practice in sewage disposal. The Annual Report of the Department of Health for 1892 presents studies which are still classics in the field of epidemiology. The State Antitoxin Laboratory has been a model of service and a center of research since 1894. The names of Theobald Smith, of William T. Sedgwick, of Hiram F. Mills and G. W. Fuller and Allen Hazen and E. O. Jordan shed luster on the early history of this unique organization; and, in recent years, Massachusetts has continued to pioneer in its comprehensive programs for the control of tuberculosis and cancer.

We congratulate the public health profession of Massachusetts on its glorious past and we look to it for continued leadership in the future.

REFERENCE

1. Patterson, Raymond S. Seventy-five Years of Public Health in Massachusetts. p. 1270, this issue.

PSYCHIATRIC SERVICE FOR THE RETURNED VETERAN

AT the meeting of the American Psychiatric Association last spring, it was announced that the objectionable label "psychoneurotic." had been dropped from the records of selectees rejected for nervous and mental conditions and replaced by the phrase "not suited for military service." This is a sensible designation, much more accurately describing the facts, since many individuals unfitted for the intense emotional hazards of modern warfare will prove successful, and often superior, members of a civilian community.

The fundamental fact remains, however that, according to Colonel L. G. Rowntree of Selective Service, between thirty and forty per cent of rejections and discharges have been related to mental and nervous status and that the total number of persons of this type in the rejected and discharged groups combined will exceed two million.

So far as discharges are concerned, the Veteran's Bureau will no doubt provide institutional care for those in need of such treatment. The great majority of both rejected and discharged groups will, however, need outpatient care alone, or outpatient care subsequent to hospitalization. The urgent question before us today is how and where this outpatient care shall be provided; and there are three major alternatives. Shall mental hygiene clinic provision be made as a special service for discharged soldiers under the direction of Veteran's Bureau hospitals? Shall it be made through community mental hygiene clinics serving all persons in need of this special type of care? Or shall it be developed as an expansion of the outpatient service of general hospitals?

It seems reasonably clear that the first of these three alternatives is least desirable. The development of new outpatient clinics under the Veteran's Bureau would involve serious duplication in a field where concentration of effort is essential. Furthermore, the treatment of the discharged soldier in such clinics would tend to label him as a special type of military psychoneurotic whereas he is essentially the same kind of individual as the rejectee for mental and emotional causes and as the ordinary civilian with similar difficulties. The strain which has accentuated his problem is different; but the task of adjustment to civilian life is the same.

On the question whether we should build increased mental hygiene service on independent mental hygiene clinics or on the outpatient services of general hospitals, Dr. J. M. Cunningham of the Connecticut State Department of Health has presented a challenging argument.[1] He points out that in addition to the men who have received various psychiatric labels at the hands of induction boards or service doctors, there is another large group in which emotional and physical defects are closely interrelated in what are now classed as psychosomatic disorders. Dr. Cunningham believes that the "integration of psychiatry and medicine may be expected to be the next great development in the application of psychiatric knowledge." Therefore, all "psychiatric service for adults should be organized as a part of the general hospital and it should be integrated with the other medical services for both in and out patients." He suggests that there should be appropriations to subsidize psychiatric diagnosis and treatment in the general hospital for both inpatient and outpatient work; that this service should be on a full-time paid basis utilizing psychiatrists, psychologists, and psychiatric social workers; and that such services should provide for veterans along with all other adult members of the community.

In states where a well organized state department of mental hygiene has been developed, the provision of community mental hygiene clinics might be conceived as a logical function of such an organization; but it should be remembered that the problem presented is not that which the ordinary state mental institution is geared to meet. The psychoneurotic individual is only rarely an incipient psychotic patient but quite a different type of person; and one who will more readily turn to a community hospital than to a clinic operated by an institution for the insane. The problem is a complex one and will not be susceptible of any general uniform solution. There is, in any case, much force in Dr. Cunningham's emphasis on the importance of psychosomatic medicine; and the plan he proposes embodies the type of decentralized and generalized service which is coming to the forefront in public health practice. Possibly clinics directed by mental hygiene departments or health departments could be organized as joint enterprises in coöperation with general hospitals.

The problem deserves the serious consideration of mental hygienists and hospital executives and of health officers—as representing general community interests in health planning.

REFERENCE

1. Cunningham, J. M. The Development of Psychiatric Service and Its Relation to the Returned Veteran. *Connecticut State M. J.*, 8, 493 (Aug.), 1944

THE NO-MAN'S LAND OF THE SMALL INDUSTRY

ONE of the most interesting sessions of our last annual meeting dealt with the admirable program for health education of industrial workers developed in the Fort Greene area of Brooklyn. Such a program, however, depends for its efficacy upon the availability of the actual health services for which health education prepares the way. There is little gain in teaching the worker about the control of tuberculosis if the air of his shop is laden with silica dust; or in emphasizing the value of health examinations and prompt treatment of disease if doctors to make these examinations and supply this treatment are not at his disposal.

We have no comprehensive knowledge of recent developments in the field of industrial health service. Just before our entry into the war, the Council on Industrial Health of the A.M.A. presented an illuminating study of the situation at that time.[1] This study cited results which are tabulated below:

Size of Plant	*Number of Plants*	*Number of Employees*
Less than 100 employees	143,615	2,260,956
100–500 employees	13,656	2,885,670
500–1,000 employees	1,660	1,333,323
Over 1,000 employees	978	2,262,282

A survey of a sample group of plants made by the Council showed that in the group of very small plants (less than 100 employees) none had a full-time physician and only 3 per cent had an industrial nurse. Of the small plants (100–500 employees) only 18 per cent had full-time medical service and only 19 per cent full-time nursing service. In the medium-sized plants (500–1,000 employees) 21 per cent had full-time medical service and 52 per cent full-time nursing service. In the large plants (over 1,000 employees) 47 per cent had full-time medical service and 85 per cent full-time nursing service. If we assume that the sample

studied was representative, 79 per cent of all the industrial workers in the country had no full-time industrial medical service.

Bloomfield and associates, in a survey conducted by the U. S. Public Health Service,[2] reported that in establishments with over 100 employees, 20.3 per cent of the workers had the services of a full-time plant physician and 27.6 per cent those of a part-time plant physician; while in establishments with less than 100 employees, the comparable figures were only 0.4 per cent and 5.6 per cent, respectively. A report of the National Association of Manufacturers[3] showed that in establishments with less than 250 employees only 13 per cent of the plants studied even had a physician in the plant at regular scheduled hours.

A more recent study of 565 industrial establishments in New York City[4] gave even more discouraging figures. Of 11 plants with over 250 employees (total employment, 12,373), 45 per cent had full-time medical service and 64 per cent had full-time nursing service; but of 554 plants with less than 250 employees (total employment, 12,470), not one had a full-time physician and "practically none had any nursing service whatsoever."

We talk optimistically about progress in industrial medicine; but the fact is that about half our total working population is in small plants which have practically no effective service of this kind. Even of the workers in medium and large plants only about half have full-time medical service, so that not over a quarter of the total industrial population is adequately provided for.

We may reasonably hope that the larger plants have learned during the past three years the values of industrial health and will provide such service for themselves after the war. But, what can be done about the small plants?

The only possible way in which such plants can be supplied with the constructive health program which they need is by common services for groups of five, ten, or twenty such establishments. To expect that small industries will voluntarily combine on their own initiative to obtain such services is fantastically wishful thinking. There must be leadership. From what source can this leadership come?

In communities where there is a medical school or a school of public health, the initiative might come from that source (as has been demonstrated on a small scale in one particular instance). In most areas, the health department is the only really practical source of leadership.

The *Journal of the A.M.A.*, in discussing the report of the Council on Industrial Health, cited above, said, "When it is found possible to extend qualified preventive medical assistance to such concerns (small plants), through the joint agencies of private practice and public health administration . . . an achievement will have been recorded in which all elements in the medical profession can take lasting satisfaction."

Is there not here an outstanding opportunity for the local health officer who desires to render constructive service to his community?

In undertaking such a project, the first step would be the formation of a local committee including representatives of local industries and of the local medical society to study the problem. Such a study would, first of all, reveal the need for expert industrial hygiene counselling with regard to shop sanitation, control of industrial hazards, and the development of a comprehensive health program in small plants—more detailed and intensive than can be supplied by the state department of health. Local industry would quite certainly support appropriations for a trained industrial hygienist on the health department staff

to provide such guidance. Next, the need would emerge for preëmployment and periodic health examinations and for industrial nursing service. A plan for providing these services could next be formulated, utilizing private practitioners of medicine and local visiting nurse organizations so far as possible but under the unified direction and supervision of the health department—for without direction and supervision no program can function effectively. Finally, the problem of remedial care would have to be faced—to be provided by the local medical profession under some plan of prepayment which would insure adequate service to the patient and adequate remuneration for the physician.

How far such a program would go in a given community would depend on circumstances and on psychology. We feel sure, however, that the health officer who will take the first step of a survey of local conditions (in coöperation with industry and with the medical profession) will open the door to one of the most vital services any health administrator can render—the bringing of the benefits of modern industrial health service to that half of our employed population which works in the No-Man's Land of the small plant.

REFERENCES

1. A General Statement of Medical Relationships in Industry. Presented by the Council on Industrial Health. *J.A.M.A.*, 114:573 (Feb. 17), 1940.
2. Bloomfield, J. J., Trasko, V. M., Sayers, R. R., Page, R. T., and Peyton, M. F. A Preliminary Survey of the Industrial Hygiene Problem in the United States. *Pub. Health Bull. No. 259*, U.S.P.H.S., 1940.
3. *Industrial Health Practices.* A Report of a Survey of 2,064 Industrial Establishments. Under the direction of V. G. Heiser. National Association of Manufacturers. New York, 1941.
4. Kresky, B., and Rosenthal, T. A Survey of Medical and Sanitary Facilities in Small Industrial Establishments. *J. Indust. Hyg. & Toxicol.*, 26, 201 (June), 1944.

THE PLACE OF PREVENTIVE MEDICINE IN THE MEDICAL CURRICULUM

THE Conference of Professors of Preventive Medicine, held at the time of our New York meeting, staged an interesting discussion on the rôle of courses in preventive medicine in the education of the physician. It was generally agreed that "Public Health" is a field for postgraduate training but that "Preventive Medicine" is an essential part of the training of the medical student. An important point was raised, however, by speakers who contended that this subject might well be taught as a part of other courses and not as a separate item in the curriculum.

Clearly this is a counsel of perfection. The day may come when personal hygiene is taught as a part of physiology and when the clinical branches of medicine are developed not only from a *preventive* aspect but also with a view to that *constructive* medicine which visualizes the ideal of health in a positive sense as the goal of the physician. Were such ideals generally realized (as they are today in some pediatric faculties), no separate department of "preventive medicine" might be needed. That day, however, is far in the future.

Even in such a Utopian situation, there is one basic element which it would be essential to add to the curriculum. Nowhere (except in "preventive medicine" or "public health") does the medical student receive instruction in the basic and fundamental influences on health of the physical and social environment. When the work of the clinical years has become thoroughly permeated with a preventive and constructive viewpoint, there will still be need for a special course (perhaps preclinical) in Environmental Therapeusis, covering the influences of

sanitation and of the community machinery and social factors influencing physical and emotional well-being. This is a subject quite as important as Materia Medica.

Finally, in considering the basic problem of arousing in the medical undergraduate a really vital interest in prevention, we should not forget the obstacles placed in our way by the present economic basis of medical practice. So long as the doctor is paid on a fee-for-service basis, his income and his opportunity for service must depend on the treatment of disease, since he will be called in only when something hurts. The medical student subconsciously realizes this fact and inevitably feels that prevention, if not hostile to his interests, is at least irrelevant to them. Only when the doctor is habitually employed on a prepayment basis for health service will preventive and constructive medicine really become vitally significant.

BOOKS AND REPORTS

All reviews are prepared on invitation. Unsolicited reviews cannot be accepted.

Introduction to Public Health—*By Harry S. Mustard. (2nd ed.) New York: Macmillan,* 1944. 283 pp. Price, $3.25.

This book is a good standard text for the college student. It is also suitable for the first course given to the student of nursing, dentistry, or medicine.

The author has been skillful in boiling down such a comprehensive subject into 283 pages and still finding room for important details. Basic principles and trends are frequently referred to. The longest chapter contains 61 pages on The Acute Communicable Diseases. Seven pages are devoted to toxoid, antitoxin, and various other aspects of diphtheria, while one interesting and up-to-date page covers Rocky Mountain Spotted Fever. The subject of Sanitation is condensed into twenty pages. The brief mention of septic tanks is hardly in proportion to the rural health officers' headaches. There is no separate mention of the sanitation of eating places or of organized health education for food handlers.

The two new chapters added since the first edition are on the subjects of Industrial Hygiene and Medical Care. The eight pages on Industrial Hygiene bring out the relationship between workmen's compensation laws, industrial accidents and diseases, and the efforts of industry. The cost of the industrial hygiene program, estimated at $10 to $15 per year for each person employed, "must prove itself to be a good investment if the businessmen concerned are to engage in or continue it." In the new chapter on Medical Care the author quotes from the National Health Survey and other reports regarding the prevalence of disabling illness and the cost of medical care. The controversy as to government participation is clearly and objectively described. The paragraph, "Some Deterrents to a Wise Course" is admirably stated.

This book contains 16 tables but no illustrations. It has a good index. Two thousand items are listed.

V. L. ELLICOTT

Postwar Planning in the United States: 3. An Organization Directory—*New York: Twentieth Century Fund,* 1944. 34 pp. Price, $1.00.

This Directory is the third in a series of surveys made by the Twentieth Century Fund, revealing that these post-war planning groups have increased from 105 in 1942 and 137 in 1943 to nearly 200 in 1944. Thirty-nine are government and 158 are private agencies. Seventeen of the total are in the welfare and health group. A brief digest is presented of the background, activities, and personnel now engaged in post-war planning under each agency. The Directory can be recommended for its inclusive character. Each agency doing post-war planning should be aware of other agencies concerned with the same field.

REGINALD M. ATWATER

Stay Young and Live—*By J. Clarence Funk, Sc.D. Richmond, Va.: The Dietz Press,* 1943. 125 pp. Price, $1.75.

This book is by the Director of Education, Virginia State Department of Health. It has a foreword by the late Claude C. Pierce, M.D., U.S.P.H.S. (ret.).

The state of mind of the author of

this book is revealed by his happy choice of 28 chapter headings. Although he discusses common, everyday subjects, he dolls them up. Here are a dozen such titles: water, Water, Water Everywhere; air, Strictly Fresh; bathing, Dipping Into It; sleep, Morpheus; elimination, Personal Plumbing; walking, Pedaling Alone; teeth, That Murderous Mouth; alcohol, Down the Hatch; cigarets, And the Smoke Goes Up the Chimney Just the Same; pain, The Friendly Enemy; self medication, Medicine Man Tactics; worry, Mental Arsenic.

Dr. Funk gives the impression that he has no intention of saying everything that occurs to him, only enough to arouse the reader's interest and whet his appetite. Thus he is chatty, uses lively words and occasional Fred Allen phrases. Perhaps with his tongue in his cheek he deals with the sex problem in two pages, whereas the teeth get six.

There are no illustrations. The book is easy reading with good type, only 28 lines to the full page. Its purpose is to spread a common sense understanding of some fundamentals in right living. He engages in some kidding of the suckers who chase after commercialized vitamins, scalp restorers, halitosis, headaches, indigestion, obesity, constipation, and fallen arches.

W. W. PETER

Building a Popular Movement—A Case Study of the Public Relations of the Boy Scouts of America —*By Harold P. Levy. New York: Russell Sage Foundation,* 1944. 165 pp. Price, $1.25.

Mr. Levy ably describes the policies and methods by which the Boy Scouts of America have become the largest organization for boys in the democratic world. With admirable judgment he avoids administrative details and addresses himself to certain fundamentals which have implications of interest to every health officer and every leader of a voluntary health organization.

Public health, like welfare, is full of associations and societies that started in fond hopes of becoming "movements," but never quite succeeded in even being efficient office organizations. The urge to create new organizations, rather than utilize old ones, shows itself in the multitude of "block plans," "district health education programs," and neighborhood committees. Derryberry, Marquette, Morgan, and Widdemer have tested and developed the strategy of such community and neighborhood plans.

The evidence seems to be that such efforts, public or voluntary, can seldom succeed unless they relate themselves effectively to established media and established community organizations. Competition from organizations of more varied interests, plus public inertia, insure a high mortality for such community plans.

Few people now remember that the Boy Scouts, even with their broad program, met comparable resistances. Their competition was keen, the attraction of militarized rivals was great. The churches were skeptical; an early blunder in policy statement quite properly raised resistance from organized labor.

Mr. Levy describes how the organization built its appeal to its members and an acceptance with the public, an acceptance that in recent years has made early critics leading supporters and troop sponsors. The alert health educator will find many ideas he can transfer or adapt—ideas of policy and strategy, not technics.

This is the second monograph Mr. Levy has produced in the Russell Sage Foundation series of "Studies in Public Relations." The first was on a public agency, the Pennsylvania Department of Public Assistance. Other studies will follow. The Foundation,

then take up the matter of germs, health protection in modern communities, homes, schools, and industry, safety and the human body. It closes with lists and descriptions of good games, food for fitness, weight-height-age tables, considerations of health and advertising and a self testing scale, a glossary and an index.

In general, this is a good book. A general criticism which applies to many portions of the book is that it leaves the reader unsatisfied in dealing too superficially with subjects which it attacks.

There is a lack of accuracy in small matters and this occurs so frequently that it becomes annoying to the well informed reader and may prove a handicap to the teacher. For example, on pages 8 and 9 reference is made to the "United States Social Security Agency." There is no federal agency by such a name. The correct title is "Federal Security Agency."

On page 59 there is emphasis on the "doorknob, book, or money that you touched" with reference to the danger of germs. The possibility of germ transmission through these common contacts is minimized in modern thinking.

On page 61 reference is made to a "tubercular" cow. The correct word is "tuberculous."

On page 62 the statement is made that "many city boys and girls do not know what fresh, unpasteurized milk tastes like." The context suggests that fresh, unpasteurized milk is superior to any pasteurized milk! this is contrary to fact in most localities.

On page 65 a totally inadequate reference is made to botulism; this should either have been omitted or enlarged.

On page 69 there is a gross error, when the claim is made on the behalf of Colonel Gorgas that "his vigorous *cleaning* of the entire area (Panama) made it possible for the workers to live without fear of infection." Gorgas failed completely when he relied merely on complete cleaning. It was specific mosquito control that brought success.

On page 75 vaccination and inoculation are referred to as if the two were identical which, of course, they are not.

On page 85 inspection of the Schick test is described as a day after the injection; the actual time is, of course, from 5 to 7 days after.

On page 87 sulfanilamide is referred to as "at first a dangerous drug" as if it were no longer dangerous when unskillfully used.

On page 91 Sister Kenny's method is referred to as "a combination of massage and hot applications"; she has vigorously denied that it is massage.

On page 101 a statement is made that sewage disposal plants have been constructed by sanitary engineers engaged by the health department. Health departments seldom engage construction engineers.

On page 114 milk is called the perfect food which, of course, it is not.

These little errors are not pointed out in a spirit of carping criticism, but because they indicate a failure to do that last careful job of checking which makes the difference between a good book such as this and the outstanding book which it might have been. It would not be difficult in a subsequent edition to correct these shortcomings.

W. W. BAUER

Voluntary Medical Insurance in the United States, Major Trends and Current Problems—*By Helen Hershfield Aunet. New York: Medical Administration Service,* 1944. 104 pp. Price, $1.00.

Physicians, public health workers, civic leaders, and others interested in trends of medical insurance in the United States will find one hundred pages of interesting facts and figures

dealing with voluntary medical insurance in the United States in this volume which is small and well written, divided into four parts, one of which is a summary. Part II, entitled "Representative Plans," deals with five group practice plans, one of which is the famous Kaiser plan. A chart on page 26 presents the more significant data with regard to services provided and costs under the five selected practice plans, each of which is discussed in some length.

The growth of the 77 "Blue Cross" hospital service plans during the past decade to nearly 12 million subscribers is attractively presented in table form and should be of much interest to both lay and professional groups that are interested in the future of more adequate medical services.

Commercially sponsored medical insurance group coverage is well treated. Several tables and a chart point out different types of health coverage, such as hospitalization, surgical, medical care, dependants, etc.

The summary deals with general trends of health insurance to cover all medical care expense; however, to date, no complete, comprehensive coverage has been given by any plan—prevention being most often omitted.

J. ROY HEGE

Fundamentals of Psychiatry—*By Edward A. Strecker. (2nd ed.) Philadelphia: Lippincott,* 1944. 205 pp. 15 Illus. Price, $3.00.

The author has assembled a body of fundamental information in compact, readable form which will enable the general practitioner, the medical student, the nurse, and the social worker "to obtain with a minimum of time a workable picture of the field of psychiatry."

The form of presentation follows the standard classifications in terms of etiology and symptomatology as used in the author's teaching experience. Well selected diagrams and short case studies are used to advantage.

In keeping with present need, chapters 9 and 10, "The Psychiatry of War" and "War Neuroses" should be of interest and use to a broader group than the medical profession alone.

Chapter 11, "The Nurse and the Psychiatric Patient," might well have been addressed to physicians as well as nurses, for we may admit the general medical practitioner too often avoids the responsibility of knowing and understanding the psychoneurotic patient, or even the average patient, as a human being with human emotions which affect his total health.

A brief glossary adds to the general clarity. This little book should help to make the beginnings of understanding psychiatry more simple, acceptable, and interesting.

MARTHA W. MACDONALD

Manual of Human Protozoa with Special Reference to Their Detection and Identification—*By Richard R. Kudo, D.Sc. Springfield: Thomas,* 1944. 125 pp. 29 figs. Price, $2.00.

This book is based upon the author's notes used in an emergency course in parasitology offered at the University of Illinois. Its viewpoint is practical, giving briefly the essential information for detecting and identifying protozoa of man. Most of the illustrations are original. All of them are drawn in black and white at uniform magnification, 1150 diameters.

The reviewer's chief criticism of this manual, or companion book, is that the figures of the malarial parasites are not in color. This lack greatly lessens its usefulness for teaching and for diagnostic purposes, since the important color characteristics of these parasites in their different phases of development are lost in black and white. Figure 27, showing various blood cells found in

stained blood films, would also have greater value had it been done in color.

It is not likely that any experienced worker will agree to the recommendation (page 53) that feces from suspected cases of dysentery be held in an incubator at 37° C. for later experimentation if an immediate or early examination is not possible. On page 71 the author calls attention to the similarity between coccidian oocysts and the eggs of two worm parasites, *Heterophyes heterophyes* and *Clonorchis sinensis*. A brief statement here as to the importance of knowing the geographical distribution of these parasites and the likelihood of a patient acquiring them would have been a helpful inclusion. Also, it should be pointed out that these two worm parasites are trematodes, not nematodes, as is stated. Barber and Kowp's method for the examination of blood for malaria is not included. This is an unfortunate omission, since this is now the preferred method and is more generally used by malariologists than the older method described on page 99. It is agreeable to note in this book the retention of the generic name Entamoeba, which is obviously correct, rather than Endamoeba, the name in common usage in North American publications. The manual is approximately pocket size. It is clearly written, well printed and bound. It will undoubtedly be a much used work of reference.

DONALD L. AUGUSTINE

A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

RAYMOND S. PATTERSON, PH.D.

Against Vitamin Cure-alls in Milk—Milk is a logical carrier of vitamin D because of its calcium and phosphorus content. Restoring the removed vitaman B's to cereals is a sensible procedure, too. But, concludes the Council on Foods and Nutrition, the addition of extra "B's" and iron and iodine to milk is not justified from the standpoint of public health needs. You'll agree.

ANON. Fortification of Milk with Vitamins and Minerals. J.A.M.A. 126, 7:432 (Oct. 14), 1944.

"The Basic Health of the American People"—Every single man Jack—and lady Jill—among us should read every word of these papers from a panel discussion on "Variations in Industrial Medical Service Plans." You may rub your eyes in amazement when you see such sentences as these: "While industrialists have been willing to assume their part in the program of medical care, medical societies have been reluctant." "The majority of prepaid medical plans to date have failed and proved totally inadequate." "Experience has demonstrated the unwisdom of initiating a medical society prepayment program on a complete coverage basis." "I think the fee for service basis is definitely wrong in caring for the needs of the people." Altogether, the series is the most wholesome airing of a vital subject that has appeared in a dog's age.

ADAMS, J. M. Stanocola Medical Care Plan (and four related papers). J.A.M.A. 126, 6:333 (Oct. 7), 1944.

Nutritional Deficiency States and Infection—Perhaps the recent demonstration that vitamin deficient animals are less susceptible to certain virus infections will call a halt on the expensive and inadequate way of insuring a

balanced diet via the pill route: so speculate these researchers at the close of a useful paper.

AYCOCK, W. L., and LUTMAN, G. E. Vitamin Deficiency as an Epidemiologic Principle. Am. J. M. Sc. 208, 3:389 (Sept.), 1944.

T. A. M. vs. A. P. T.—Seven years' experience with toxin-antitoxin convinced this British M. O. H. that in it he had a stable and reliable immunizing agent. A comparable experience with toxoid leads him to believe it to be a prophylactic of variable potency. Now that toxin-antitoxin is no longer to be available, the "posterior Schick Test" must be stressed, says he. Also he wants an assured immunity in infancy rather than an unchecked initial course with a later "refill."

ANDERSON, A. Diphtheria Immunization. Pub. Health. 57, 12:131 (Sept.), 1944.

"Preach and Treat" Found Wanting—This paper is so long that I haven't the will power to wade through it but it ends with this paragraph: "The campaign of enlightenment and early treatment ('Preach and Treat') has failed, and will continue to do so until the public is educated in the methods of early and late preventive treatment and until there is compulsory notification (by numbers and not names) of all these diseases. Enormous sums of money are being spent on enlightenment and early treatment, but why not solve the problem entirely by using a little of it on early preventive treatment and compulsory notification?" Decide for yourself if you need to know the argument.

HARKNESS, A. H. Venereal Disease. J. Roy. San. Inst. 7, 10:252 (Oct.), 1944.

Department of Human Behavior—Of the troops served, 15–30 per cent refused any vegetable other than potatoes, as many as half the men failed to eat the entire serving and the uneaten remainders varied from 15 per cent (tomatoes) to 56 per cent (turnips). The men get precious little vitamin C from this source.

HOPKINS, J. W., *et al.* Statistical Estimation of Vitamin C Intake of Troops in Canadian Army Garrison Rations. Canad. Pub. Health J. 35, 10:384 (Oct.), 1944.

Plague—Because it is just a matter-of-fact account of the businesslike way the health officials went about the destruction of rats when plague ridden rodents were discovered in Tacoma, this paper is a pleasure to read. So it is commended to you even though it is quite likely that plague is one disease with which you will never deal.

HUNDLEY, J. M., and NASI, K. W. Anti-Plague Measures in Tacoma, Washington. Pub. Health Rep. 59, 38:1239 (Sept. 22), 1944.

Whose Fault?—A horrifying proportion of young American men are found unfit for military service. Who will be the scapegoat, the whipping boy to bear the blame? The schools, inevitably. After removing from the list the mental and physical defects which could not possibly be blamed on our schools, this editorial asks: what is left? This is "anybody's fight" so you may want to get in it.

KEENE, C. H. Editorial. J. School Health. 14, 8:202 (Oct.), 1944.

Another Penicillin Victory—It seems that penicillin works with congenital syphilis, too.

LENTZ, J. W., *et al.* Penicillin in the Prevention and Treatment of Congenital Syphilis. J.A.M.A. 126, 7:408 (Oct. 14), 1944.

Now You Can Really See Them—Not to be missed are these excellent pictures of bacteria and Rickettsias and viruses, their descriptions, and the discussion which accompanies them.

MUDD, S., and ANDERSON, T. F. Pathogenic Bacteria, Rickettsias, and Viruses as Shown by the Electron Microscope. J.A.M.A. 126, 9:561 (Oct. 28), 1944.

Good Job Well Done—You will be impressed by this straightforward story of the epidemiologic study of an outbreak of virulent pneumonitis which originated Heaven-knows-how, and spread by direct contact from fatal cases to nursing attendants. The causative agent was isolated and will be described in a later article.

OLSON, B. J., and TREUTING, W. L. An Epidemic of a Severe Pneumonitis in the Bayou Region of Louisiana. Pub. Health Rep. 59, 40:1299 (Oct. 6), 1944.

For the Idly Curious—This is really none of our business, but as a sidewalk superintendent, you may want to know that an army doctor reports 11 of 12 patients with gonorrhea as being cured by one shot of penicillin in a mixture of beeswax and peanut oil (which slows the absorption of the drug).

ROMANSKY, M. J., and RITTMAN, G. E. A Method of Prolonging the Action of Penicillin. Science. 100, 2592:196 (Sept.), 1944.

On Being Realistic about V. D.—Even though you may not, at the moment, be greatly concerned about V. D. or nursing, you should read this paper carefully in order to observe one man at work injecting new life into an old subject. Most professional people are such poor writers that they have much to learn from one who isn't.

SHOSTAC, P. The Nurse in Industry Organizes Against V. D. Pub. Health Nurs. 36, 10:302 (Oct.), 1944.

Constructive Medicine? — Dr. Steiglitz offers this term as a preferred synonym for preventive medicine. There *must* be a better term. Please help.

STEIGLITZ, E. J. Constructive Medicine. Science. 100, 2597:313 (Oct. 6), 1944.

When Experts Disagree—Suffering, as I do, from an abysmal ignorance of the whole subject, the reading of this lively symposium left me with a conviction that there must be a great deal yet to be learned about rheumatic fever.

WILSON, M. G., and LUBSCHEZ, R. Recurrence Rates in Rheumatic Fever (and four related papers). J.A.M.A. 126, 8:477 (Oct. 21), 1944.

BOOKS RECEIVED

HEALTH PRACTICE INDICES. Compiled from the Evaluation Schedules, Prepared by the Subcommittee on Manual of Practice and Appraisal of Local Health Work for the Committee on Administrative Practice of the American Public Health Association for 1943. 1944. 116 pp. Free.

NEW ARCHITECTURE AND CITY PLANNING. A Symposium. Edited by Paul Zucker. New York: Philosophical Library, 1944. 694 pp. Price, $10.00.

WHAT YOU SHOULD KNOW ABOUT TOBACCO. By Frank Leighton Wood, M.D. Grand Rapids: Zondervan Publishing House, 1944. 147 pp. Price, $1.50.

TRICHINOSIS. By Sylvester E. Gould, M.D. Springfield, Ill.: Thomas, 1945. 356 pp. Price, $5.00.

AND NOW TO LIVE AGAIN. By Betsey Barton. New York: D. Appleton-Century, 1944. 150 pp. Price, $1.75.

EDUCATION FOR ALL AMERICAN YOUTH. Washington, D. C.: Educational Policies Commission, National Education Association of the United States, 1944. 421 pp.

WOMEN AND MEN. By Amram Scheinfeld. New York: Harcourt, Brace, 1944. 453 pp. Price, $3.50.

FOES AFTER FORTY. By W. W. Bauer, M.D. Boston: John Hancock Mutual Life Insurance Company, 1944. 24 pp. Free from publisher.

CHILD CARE AND DEVELOPMENT. New York: Community Service Society, Department of Educational Nursing, 1944. 14 pp. 10¢ for single copies.

METHODS FOR DETERMINING LEAD IN AIR AND IN BIOLOGICAL MATERIALS. A Report Prepared by the Subcommittee on Chemical Methods of the Committee on Ventilation and Atmospheric Pollution of the Industrial Hygiene Section of the American Public Health Association. F. H. Goldman, Ph D., Chairman. New York: American Public Health Association, 1944. 41 pp. Price, $.75.

ASSOCIATION NEWS

Milton J. Rosenau, M.D., President-Elect American Public Health Association

Dr. Milton J. Rosenau, Dean of the School of Public Health and Professor of Epidemiology at the University of North Carolina, Chapel Hill, was chosen President-Elect of the American Public Health Association at the 73rd Annual Meeting in New York City. Dr. Rosenau was born January 1, 1869, in Philadelphia. He received his medical degree in 1889 from the University of Pennsylvania, and an honorary A.M. from Harvard in 1914. He studied in Berlin, in Paris, and Vienna between 1892 and 1900. Dr. Rosenau served as Surgeon in the U. S. Public Health Service from 1890 to 1909, and for the last ten years of this period was Director of the Hygienic Laboratory (now the National Institute of Health). He was Professor of Preventive Medicine and Hygiene at Harvard from 1909 to 1935, Director of the School of Public Health, Harvard University and Massachusetts Institute of Technology 1913 to 1922, Professor of Epidemiology at the Harvard School of Public Health 1922–1935, Director of the Antitoxin and Vaccine Laboratory and Chief of the Division of Biologic Laboratories of the Massachusetts Board of Health 1914 to 1921. Since 1936 Dr. Rosenau has been in his present position at the new School of Public Health, University of North Carolina.

Among many honors that have come to Dr. Rosenau are presidencies of the American Society of Tropical Medicine, American Society of Epidemiologists, American Association of Immunologists, the American Association of Medical Milk Commissions, the Society of American Bacteriologists, and the Gold Medal of American Medicine for Service to Humanity, as well as the Sedgwick Memorial Medal which he received in 1934.



MILTON J. ROSENAU, M D.

Dr. Rosenau is best known for his volume on *Preventive Medicine and Hygiene,* of which the 6th edition was published in 1935. He is also the author of *Disinfection and Disinfectants,* 1901, and of *The Milk Question,* 1912. His principal scientific researches have included the standardization of tetanus and diphtheria antitoxins, the epidemiology of typhoid fever, poliomyelitis, influenza, etc., contributions to anaphylaxis, studies on pasteurization, foot and mouth disease, vaccine virus, and on milk and its rela-

tion to the public health. Dr. Rosenau's bibliography includes more than one hundred and fifty titles.

In his long career, Dr. Rosenau established the first chair of Preventive Medicine and the first School of Public Health, both at Harvard. The Hygienic Laboratory was the first of its kind on this continent. Exceedingly few writers and teachers in the field of public health are as widely known as Dr. Rosenau. The American Public Health Association honors itself in honoring him.

RESOLUTIONS

The following Resolutions were unanimously adopted by the Association at the Seventy-third Annual Meeting in New York, N. Y., October 3–5, 1944.

1. APPRECIATION

TO DR. STEBBINS AND THE LOCAL COMMITTEE

RESOLVED that the American Public Health Association acknowledges its sincere appreciation to the New York Local Committee and the agencies and individuals represented thereon for their untiring efforts in connection with this Conference.

RESOLVED that the Association expresses its gratitude to Dr. Ernest L. Stebbins, Health Commissioner of New York and General Chairman of the Local Committee, and to the chairmen and members of the several subcommittees for their wholehearted cooperation and assistance in the planning and conduct of this Second Wartime Conference in New York City.

TO NEW YORK CONVENTION AND VISITORS BUREAU AND TO THE HOTEL PENNSYLVANIA

RESOLVED that the American Public Health Association records its appreciation to the New York Convention and Visitors Bureau and to the Hotel Pennsylvania for their splendid coöperation in making available the necessary facilities and space for the conduct of this Annual Meeting.

TO COÖPERATING AGENCIES

RESOLVED that the American Public Health Association extends its sincere thanks to the Public Health Association of New York City, to the National Health Council agencies, to the National Health Library, and to the National Publicity Council for their services in behalf of the Second Wartime Conference.

TO THE PRESS AND RADIO

RESOLVED that the American Public Health Association gratefully acknowledges the generous service of the press and radio, state and local, in carrying the message of the Wartime Public Health Conference to the public.

TO THE EXHIBITORS

RESOLVED that the American Public Health Association expresses its appreciation to its friends and coöperators who have presented such excellent exhibits for the interest and benefit of delegates at this Convention.

2. IN MEMORIAM

WHEREAS, a divine Providence in its wisdom and justice has seen fit to remove from our midst the following members of our Association and,

WHEREAS, by death we have been deprived of the companionship, advice, and counsel of these able and capable members in the Association, therefore be it

RESOLVED that we express our sorrow at the loss that we as members and collectively as the Association have sustained.

Fred Adams, M.B., D.P.H., Windsor, Ont., Elected Member 1914, Charter Fellow 1922.

Alice Ahern, R.N., Ottawa, Ont., Elected Member 1928.

Henry H. Asher, M.D., Manistique, Mich., Elected Member 1938.

Clarence M. Baker, Madison, Wis., Elected Member 1914, Charter Fellow 1922.

Ezra G. Carter, Dr.P.H., Logan, Utah, Elected Member 1924.

John F. D. Cook, M.D., Pierre, S. D., Elected Member 1939.

Walter W. Council, M.D., Juneau, Alaska, Elected Member 1933.

John E. Custis, M.D., Lemmon, S.D., Elected Member 1944.

W. F. Davison, M.D., Kingston, Pa., Elected Member 1930.

Meta DeLoache, Paterson, N. J., Elected Member 1941.

W. D. Dotterer, Chicago, Ill., Elected Member 1916, Fellow 1942.

Samuel M. Ellsworth, Boston, Mass., Elected Member 1939, Charter Fellow 1943.

Charles E. Finlay, M.D., Havana, Cuba, Elected Member 1940, Charter Fellow 1942.

James V. Foley, M.D., M.P.H., Pocatello, Idaho, Elected Member 1941.

W. Brownley Foster, M.D., Richmond, Va., Elected Member 1908, Charter Fellow 1923.

Julia George, Berkeley, Calif., Elected Member 1920.

Selskar M. Gunn, New York, N. Y., Elected Member 1905, Charter Fellow 1922.

Paul Hansen, Chicago, Ill., Elected Member 1905, Charter Fellow 1922.

Olaf Haraldson, M.D., Minot, N. D., Elected *Member 1942.*

Mrs. Mary S. Hull, R.N., Santa Fe, N. M., Elected Member 1940.

George E. Johnson, M.D., Philadelphia, Pa., Elected Member 1934.

Wilhelm O. Johnson, Springfield, Mass., Elected Member 1939.

Robert W. Kehr, Seattle, Wash., Elected Member 1934.

J. H. Kellogg, M.D., Battle Creek, Mich., Elected Member 1878

Israel J. Kligler, Ph.D., Jerusalem, Palestine, Elected Member 1912, Charter Fellow 1922.

J. Leake, M.D., Portsmouth, Va., Elected Member 1933.

Mary McCormick, R.N., Albany, N. Y., Elected Member 1937.

James R. McEachern, M.D., Tampa, Fla., Elected Member 1932, Charter Fellow 1936.

J. J. McShane, M.D., Dr.P.H., Springfield, Ill, Elected Member 1915, Charter Fellow 1922.

Paul Molitor, Chatham, N. J., Elected Member 1932.

H. Allen Moyer, M.D., Charlotte, Mich., Elected Member 1939.

Percy F. Murray, Peabody, Mass., Elected Member 1929.

Harry B. Neagle, M.D., Providence, R. I., Elected Member 1918.

J. F. Nickerson, Chicago, Ill., Elected Member 1912.

John Overton, M.D., Nashville, Tenn., Elected Member 1927.

M. B. Owens, M.D., Newport, Ark., Elected Member 1931.

Lillian A. Phelps, Oneonta, N. Y., Elected Member 1943.

Adrien Plamondon, Montreal, Que., Can., Elected Member 1931

Aurelia B. Potts, R.N., Nashville, Tenn., Elected Member 1928, Charter Fellow 1934.

William M. Randolph, M.D., Charlottesville, Va., Elected Member 1936.

C. B. Ransone, M.D., Roanoke, Va., Elected Member 1924.

Arm'n V. St. George, M.D., New York, N. Y., Elected Member 1934.

William V. Sanford, M.D., Ripley, Tenn., Elected Member 1930.

Herman M. Schoberg, St. Paul, Minn., Elected Member 1923.

Blanche F. Sigman, Copley, Ohio, Elected Member 1941.

Dr. Rafael Silva, Mexico City, Mexico, Elected Member 1930.

Robert M. Stith, M.D., Highlands, Wash., Elected Member 1925.

A. L. Stone, M.D., Camden, N. J., Elected Member 1920.

Thomas A. Storey, M.D., Stanford University, Calif., Elected Member 1912, Charter Fellow 1922.

Hassow Van Wedel, M.D., New Rochelle, N. Y., Elected Member 1915, Charter Fellow 1922.

Lewis W. Waters, New York, N. Y., Elected Member 1937.

Clifford C. Young. D.P.H., Lansing, Mich., Elected Member 1912, Charter Fellow 1922.

3. SERVING OF NUTRITIOUS MEALS TO SCHOOL CHILDREN

WHEREAS, the serving of nutritious meals to children attending school has been demonstrated to be an important aspect of both the health program and the educational program of the school, and

WHEREAS, the financial ability of a school system to serve adequate meals within the means of the child patrons is likely to be least in those areas in which the nutritional need is greatest, be it

RESOLVED that the American Public Health Association favors aid to school systems to make possible the serving of meals under administrative control and technical supervision by school authorities. Such aid should be conditional on the maintenance of adequate but reasonable standards, providing for safe, wholesome foods combined into nourishing meals, dispensed without profit to the school or any other agency, and served without discrimination between those children who can pay for their meals and those who cannot.

4. CONTINUED ENRICHMENT OF STAPLE FOODS

WHEREAS, the order of the War Food Administrator making compulsory the enrichment of white bread and rolls, the legislative action of certain states with regard to enrichment of certain staple foodstuffs,

and the voluntary action of many food industries have resulted in an improvement in the national dietary with respect to several highly essential nutrient elements, and

WHEREAS, this enrichment in staple low cost foods has been of proportionately greater benefit to the economic groups whose diet is most in need of betterment, and

WHEREAS, the federal order for enrichment of white bread and rolls will terminate with the passing of the war emergency, be it

RESOLVED that the American Public Health Association goes on record as favoring appropriate state and federal action to perpetuate the benefits that have accrued to the national dietary through enrichment of staple foods in accordance with the recommendations of the National Research Council.

5. ADEQUATE COMPENSATION FOR PUBLIC HEALTH PERSONNEL

WHEREAS, the application and administration of public health principles and skills has become a specialty for which special training is required, and

WHEREAS, the safeguarding and improvement of the health of the people have always been primary concerns of the State, presenting opportunities and responsibilities that have attracted and should continue to attract some of the ablest members of various professions, and

WHEREAS, public health workers have often devoted their lives to this field at the cost of such personal sacrifice as inadequate compensation, political interference, insecure tenure of office, lack of opportunity for research or for personal advancement, and

WHEREAS, this Association has repeatedly pointed out the fact that many sections of the country are now without the benefit of any full-time, trained public health workers, and other sections have woefully inadequate numbers of trained public health workers, and

WHEREAS, the post-war period will call for even larger numbers of competent people to safeguard the public health, now therefore be it

RESOLVED that—

1. Adequate compensation and reasonable security in tenure of office will be necessary before public health workers with proper professional qualifications to assume the heavy responsibility of protecting and improving the health of the public will be available in sufficient number to meet the nation's existing and future needs.

2. It is the considered opinion of this Association that health officers and all other specialists in the public health field who have been specially trained for their highly important work should be compensated for their services in an amount comparable with the net income of their professional colleagues in the community.

6. A NATIONAL PROGRAM OF DENTAL CARE

WHEREAS, the public health professions have long sought means to develop a program of preventive dental services, and

WHEREAS, dental surveys almost universally disclose a widespread prevalence of dental disease in the United States, and

WHEREAS, dental disease was the greatest single factor in rejection among selectees at the beginning of the present world conflict, and

WHEREAS, the dental problem requires organized group action for its solution as a part of a general medical care program, therefore be it

RESOLVED that the American Public Health Association endorse and support efforts along the following lines:

1. Research to reduce the incidence of dental disease.
2. Research and demonstration to develop and test administrative procedures designed to reduce the cost and increase the spread of dental care.
3. Education of the public in the need of early and continuous dental care to prevent an increasing accumulation of dental defects.
4. Development of reparative programs, especially for the younger age groups.
5. Stimulation of health agencies at local, state, and federal levels to secure funds and recruit and train personnel to implement the foregoing program.

Be it further

RESOLVED that the Executive Board of the American Public Health Association institute such measures as may be necessary for obtaining the above objectives.

7. MEDICAL CARE

WHEREAS, adequate medical, nursing, and dental care for all is fundamental to the health and happiness of the people of the United states, be it therefore

RESOLVED that the American Public Health Association endorse the principle that each health department should feel a responsibility for seeing that within its jurisdiction

an adequate program for such medical care be developed as promptly as practicable.

8. Assistance to United Nations Relief and Rehabilitation Administration

WHEREAS, the United Nations Relief and Rehabilitation Administration has been entrusted with the responsibility of assisting in the rehabilitation of countries which have been ravaged by the enemy, and,

WHEREAS, one of the principal objectives of this Administration is to restore to full function national health departments, be it therefore

RESOLVED that the American Public Health Association express its full sympathy with this objective and that the Executive Board be requested to seek ways and means by which the Association may assist the United Nations Relief and Rehabilitation Administration in its great task.

9. International Public Health Organization

WHEREAS, by the grace of God, the bravery and skill of the military forces of the United Nations are about to be rewarded by complete victory, and

WHEREAS, the promotion of public health in all parts of the world is recognized by all to be of paramount importance to the future happiness and prosperity of mankind, and

WHEREAS, there exists at present no international public health organization whose activities are world-wide in scope, be it therefore

RESOLVED that the Executive Board be requested to bring to the attention of the Government of the United States of America, in the name of the American Public Health Association, the urgent need of immediate planning for the development of such an agency.

NEW FELLOWS OF THE A.P.H.A. ELECTED AT THE 73rd ANNUAL BUSINESS MEETING

Health Officers Section

Samuel D. Allison, M.D., M.P.H., Venereal Disease Control Officer, Territorial Board of Health, Honolulu, T. H.

Will H. Aufranc, M.D., M.P.H., Surgeon (R), U. S. Public Health Service; Venereal Disease Control Officer, State Board of Health, Portland, Ore.

Floyd C. Beelman, M.D., Secretary and Executive Officer, State Board of Health, Topeka, Kans.

Ruth E. Church, M.D., M.S.P.H., Medical Director, Washington County Health Unit and District Health Service 7, Washington, Iowa

Harold M. Erickson, M.D., M.P.H., Assistant State Health Officer, Portland, Ore.

Stanford F. Farnsworth, M.D., M.P.H., Health Officer, Oakland, Calif.

Warren F. Fox, M.D., Riverside County Health Officer, Riverside, Calif.

Donald K. Freedman, M.D., Health Officer, Newport News, Va.

Clifton F. Hall, M.D., M.P.H., Director, Mecosta-Osceola Health Department, Big Rapids, Mich.

Austin E. Hill, M.D., M.P.H., Director of Public Health, Houston, Tex.

Lt. Commander Harold Jacobziner, USN, Acting Sanitation Officer and Quarantine Officer, Norfolk Navy Yard, Portsmouth, Va.

Irvin Kerlan, M.D., C.P.H., Medical Officer, U. S. Food and Drug Administration, Washington, D. C.

James P. O'Brien, M.D., C.P.H., District Health Officer, Northern Health Unit, Woonsocket, R. I.

Major Frank W. Parker, Jr., M.C., Chief, Preventive Medicine Branch, Medical Section, Headquarters First Air Force, USAAF, Mitchel Field, N. Y.

Cecil A. Z. Sharp, M.D., M.S.P.H., Will County Health Officer, Joliet, Ill.

Wilfred N. Sisk, M.D., M.P.H., Director and Health Officer, Buncombe County Health Department, Asheville, N. C.

Hubert O. Swartout, M.D., Dr.P.H., Los Angeles County Health Officer, Los Angeles, Calif.

Jules R. Thebaud, D.D.S, Director General, National Public Health Service, Port-au-Prince, Haiti

Glen S. Usher, M.D., Chief, Bureau of Venereal Disease Control, State Health Department, Trenton, N. J.

Benjamin F. Wyman, M.D., State Health Officer, Columbia, S. C.

Laboratory Section

Luther A. Black, Ph.D., Senior Bacteriologist, U. S. Public Health Service, Cincinnati, O.

Geoffrey Edsall, M.D., Acting Director, Divi-

sion of Biologic Laboratories, State Department of Public Health, Boston, Mass.
Carolyn R. Falk, B.A., Bacteriologist, Department of Health, New York, N. Y.
Stanley E. Hartsell, Ph.D., Associate Professor of Bacteriology, Purdue University, W. Lafayette, Ind.
Nell Hirschberg, Ph.D., Associate Bacteriologist, U. S. Public Health Service, Raleigh, N. C.
Melvin E. Koons, M.P.H., Director, Division of Laboratories, State Department of Health, Grand Forks, N. D.
Malcolm H. Merrill, M.D., Chief, Division of Laboratories, State Department of Public Health, Berkeley, Calif.
Pablo Morales Otero, M.D., Director and Professor of Bacteriology and Immunology, School of Tropical Medicine, San Juan, P. R.
Leslie A. Sandholzer, Ph.D., Associate, U. S. Department of the Interior, College Park, Md.
Anna M. Sexton, Librarian, Division of Laboratories and Research, State Department of Health, Albany, N. Y.
Aimee Wilcox, Assistant Protozoologist, U. S. Public Health Service, Memphis, Tenn.

Vital Statistics Section

Anthony J. Borowski, Dr.P.H., Assistant in Biostatistics, Medical College of Virginia, and Statistician and Chief Clerk, Health Department, Richmond, Va.
Clara E. Councell, M.S., Medical Research Officer, Office of Coordinator of Inter-American Affairs, Washington, D. C.
Paul M. Densen, D.Sc., Assistant Professor of Preventive Medicine and Public Health, Vanderbilt University Medical School, Nashville, Tenn.
Forrest E. Linder, Ph.D., Assistant Chief Statistician, Bureau of the Census, Washington, D. C.
Frances A. Macdonald, A.B. (formerly Director, Bureau of Vital Statistics, Board of Health, Hartford, Conn.)
Alan E. Treloar, Ph.D., Associate Professor of Biostatistics, School of Public Health, University of Minnesota, Minneapolis, Minn.

Engineering Section

Raymond F. Goudey, M.S.C.E., Sanitary Engineer, Department of Water and Power, Los Angeles, Calif.
John M. Henderson, C.E., Senior Sanitary Engineer (R), U. S. Public Health Service, Atlanta, Ga.
Glen J. Hopkins, B.S.C.E., Director, Division of Engineering, State Board of Health, Pierre, S. D.
Nelson H. Rector, B.E.C.E., Sanitary Engineer (R), U. S. Public Health Service, Atlanta, Ga.

Industrial Hygiene Section

Allen D. Brandt, Sc.D., Sanitary Engineer, U. S. Public Health Service, Chicago, Ill.
Irving Gray, M.D., Practitioner of Industrial Medicine; Member, Public Health Committee, and Chairman, Committee on Industrial Health, Kings County Medical Society; Member, Public Health Committee, Brooklyn Chamber of Commerce, Brooklyn, N. Y.

Food and Nutrition Section

Ernestine Becker, M.A., Associate in Biochemistry and Nutrition, Johns Hopkins School of Hygiene and Public Health, Baltimore, Md.
Anna E. Boller, Ph.B., Chief Dietitian, Central Free Dispensary, Rush Medical College, Chicago, Ill.
Lt. Col. Cecil G. Dunn, Q.M.C., Chief, Dehydration Section, Office of the Quartermaster General, U. S. Army, Washington, D. C.
Lloyd A. Hall, Sc.D., Chief Chemist, The Griffith Laboratories, Chicago, Ill.
Norman H. Jolliffe, M.D., Chief, Medical Service, Psychiatric Division, Bellevue Hospital, and Lecturer in Public Health Practice, College of Physicians and Surgeons, New York, N. Y.
Gordon W. Molyneux, Supervising Milk Inspector, Westchester County Department of Health, White Plains, N. Y.
Pearl Rorabaugh, M.S., Nutritionist, State Department of Health, Topeka, Kans.
Fredrick J. Stare, M.D., Ph.D., Associate Professor of Nutrition, Harvard School of Public Health, Boston, Mass.

Maternal and Child Health Section

Paul R. Ensign, M.D., M.P.H., Pediatric Consultant, State Department of Health, Atlanta, Ga.
Major Samuel B. Kirkwood, M.C., Ashford General Hospital, West Virginia (formerly Instructor in Obstetrics and Maternal Health, Harvard Medical School and School of Public Health)
Martha A. O'Malley, M.D., M.P.H., Assistant in Child Hygiene, Harvard School of Public Health, Boston, Mass.
Louis Spekter, M.D., M.P.H., Chief, Division of Crippled Children, State Department of Health, Hartford, Conn.
Blanca H. Trelles de Vazquez, M.D., Chief, Bureau of Crippled Children, Department of Health, Santurce, P. R.

L. C. Newton Wayland, M.D., Director, Maternal and Child Health, Santa Barbara County Health Department, Santa Barbara, Calif.

Public Health Education Section

Jean Christopher, M.S.P.H., Health Education Consultant, State Department of Public Health, Springfield, Ill.

Bertha A. Hess, M.S.P.H., Consultant on Mental and Social Hygiene, State Department of Health, Columbus, Ohio

Rae E. Kaufer, B.S.Ed., Assistant Health Education Consultant, U. S. Public Health Service, Bethesda, Md.

Philip L. Riley, M.A., Directing Supervisor, Bureau of Physical Welfare, Board of Education, Cleveland, Ohio

Lewis C. Robbins, M.D., M.P.H., Director, Wichita Health Unit, Wichita Falls, Tex.

Mabel E. Rugen, Ph.D., Associate Professor of Health Education, School of Public Health, University of Michigan, Ann Arbor, Mich.

Public Health Nursing Section

Bertha L. Allwardt, R.N., B.S., Associate Public Health Nursing Consultant, U. S. Public Health Service, Dallas, Tex.

Ada M. Beerstecher, R.N., M.A., Executive Secretary, Community Health and Civic Association, Ardmore, Pa.

Zella Bryant, R.N., Assistant Chief Nurse, Nursing Section, Medical Division, Office of Civilian Defense, U. S. Public Health Service, 610 South Canal, Room 852, Chicago, Ill.

Elizabeth Curtis, R.N., M.A., Assistant Public Health Nursing Consultant, U. S. Public Health Service, New Orleans, La.

Josephine L. Daniel, R.N., B.S., Director, Division of Public Health Nursing, State Health Department, Oklahoma City, Okla.

Winifred Devlin, R.N., M.S., Instructor in Public Health Nursing and Field Coordinator, School of Nursing, Catholic University, Washington, D. C.

G. Aileen Dyer, R.N., B.S., Director, Division of Public Health Nursing, State Board of Health, Portland, Ore.

Marion Ferguson, R.N., Ph.D., Public Health Nursing Consultant, U. S. Public Health Service, Chicago, Ill.

Theodora A. Floyd, R.N., M.A., Regional Consultant Nurse, U. S. Children's Bureau, Atlanta, Ga.

Ruth B. Freeman, R.N., A.M., Associate Professor and Director, Course in Public Health Nursing, School of Public Health, University of Minnesota, Minneapolis, Minn.

Lillian A. Gardiner, R.N., M.S., Director, Division of Public Health Nursing, Territorial Department of Health, Juneau, Alaska

Ruth G. George, R.N., State Supervising Nurse, State Board of Health, Columbia, S. C.

Edna S. Gould, R.N., B.S., Field Coordinator and Instructor of Public Health Nursing, Indiana University, Bloomington, Ind.

Lily C. Hagerman, R.N., B.S., Public Health Nursing Consultant, U. S. Public Health Service, Kansas City, Mo.

Hazel G. Herringshaw, R.N., M.Ed., Assistant Professor of Public Health Nursing, University of Michigan, Ann Arbor, Mich.

E. Doris Johnson, R.N., M.S., Public Health Nursing Consultant, U. S. Public Health Service, New York, N. Y.

A. Louise Kinney, R.N., M.A., Director, Division of Public Health Nursing, St. Louis University School of Nursing, St. Louis, Mo.

Florence Manley, R.N., M.A., District Supervising Nurse, State Department of Health, Buffalo, N. Y.

Lucy E. Massey, R.N., M.A., Nurse Member, School Health Coordinating Unit, State Board of Health, Jackson, Miss.

Anne H. McCabe, R.N., M.A., Director, Division of Public Health Nursing, Westchester County Health Department, White Plains, N. Y.

Marion I. Murphy, R.N., B.S., Assistant Director, Bureau of Public Health Nursing, State Department of Health, Lansing, Mich.

Hope Newell, R.N., B.S., Executive Secretary, National Classification Committee, National Nursing Council for War Service, New York, N. Y.

Laura E. Peck, R.N., B.S., Supervisor and Consultant, Communicable Disease Nursing, Department of Health, Detroit, Mich.

Lucile A. Perozzi, R.N., M.A., Regional Public Health Nursing Consultant, U. S. Children's Bureau, Washington, D. C.

Elisabeth C. Phillips, R.N., M.A., Assistant Director, Visiting Nurse Service of New York, New York, N. Y.

M. Caroline Quigley, R.N., C.P.H., Assistant Director, Division of Public Health Nursing, State Department of Health, New Orleans, La.

Dorothy I. Rusby, R.N., M.A., Assistant Director, National Organization for Public Health Nursing, New York, N. Y.

Ethel C. Ryckman, R.N., B.S., Supervising Nurse, Hillsdale County Health Department, Hillsdale, Mich.

Hazel Shortal, R.N., B.S., Instructor, St. Louis University, St. Louis, Mo.

Ruth G. Taylor, R.N., M.A., Director, Nurs-

ing Unit, U. S. Children's Bureau, Washington, D. C.

Alberta B. Wilson, R.N., M.S., Director, Division of Public Health Nursing, State Board of Health, Dover, Del.

Epidemiology Section

Eugene P. Campbell, M.D., M.P.H., Field Director, Division of Health and Sanitation, Office of Coordinator of Inter-American Affairs, Guatemala City, Guatemala.

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School Health Section

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Solomon S. Lifson, M.A., C.P.H., Health Education Consultant, U. S. Public Health Service, New York, N. Y.

Genevieve R. Soller, R.N., M.S.P.H., Coordinator, Community Health Service Project, State Department of Public Instruction, Ypsilanti, Mich.

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Dental Health Section

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Thomas W. Clune, D.M.D., M.P.H., Public Health Dentist, State Department of Health, Providence, R. I.

Bion R. East, D.D.S., Assistant Professor of Public Health Practice, DeLamar Institute of Public Health, Columbia University, New York, N. Y.

John W. Knutson, D.D.S., Dr.P.H., Dental Consultant to State Health Authorities, U. S. Public Health Service, Bethesda, Md.

Unaffiliated

Stuart W. Adler, M.D., Director, Division of Maternal and Child Health, State Department of Health, Albuquerque, N. M.

West J. Altenburg, Ph.D., New York State Representative, National Foundation for Infantile Paralysis, Albany, N. Y.

E. Harold Hinman, M.D., M.P.H. Chief of Party, Institute of Inter-American Affairs, Mexico, D. F., Mexico

Samuel H. Hopper, Ph.D., P. A. Sanitarian (R), U. S. Public Health Service, Chapel Hill, N. C.

Capt. Nicholas C. Leone, Sn.C., Nutrition Officer, Allied Military Government (overseas)

John D. Long, M.D., D.Sc., Traveling Representative, Pan American Sanitary Bureau, Lima, Peru

Maurice C. O'Shea, M.D., School Medical Inspector, Board of Education, New York, N. Y.

Ralph M. Palmer, M.A., Consulting Chemical Engineer, New York, N. Y.

Solomon L. Pearlman, M.D., M.S.P.H., Director of Venereal Disease Clinics, Health Department, Chicago, Ill.

Lyon P. Strean, Ph.D., D.D.S., Scientific Director, Ayerst, McKenna and Harrison, Ltd., New York, N. Y.

APPLICANTS FOR MEMBERSHIP

The following individuals have applied for membership in the Association. They have requested affiliation with the sections indicated.

Health Officers Section

Mauldin J. Boggs, Jr., M.D., M.P.H., 67 N. Main St., Abbeville, S. C., District Health Officer, State Board of Health

Wei Chang, M.D., M.P.H., National Health Administration, Chungking, China, Deputy Chief of Health Section, Central Planning Board of China

Claire A. Christman, M.D., 2141 Eye St., N.W., Washington, D. C., Asst. Health Officer, Montgomery County Health Dept.

Allan R. Doane, M.D., 120 King St., Welland, Ont., Canada, Medical Officer of Health

Felipe Garcia-Sanchez, Calzada La Piedad 6, Desp. 101, Mexico, D.F., Mexico, Sub-Director of the General Office of the Ministry of Health and Welfare

Capt. Philip Kramer, M.C., Station Hospital, Fort Snelling, Minn., Medical Officer, U. S. Army

Jefferson C. Newman, M.D., Dodge-Saunders County Health Unit, Wahoo, Nebr., Director

Abraham Pansy, M.D., 12 Jackson St., South River, N. J., Health Officer

William L. Phillips, M.D., Obion-Lake District Health Dept., Tiptonville, Tenn., Director

Elson B. Potts, M.D., City Hall, St. Thomas, Ont., Canada, Medical Officer of Health

Norman D. Thetford, M.D., Christiansted, St. Croix, Virgin Islands, Asst. Commissioner of Health

Ruth B. Thomas, M.D., Bellevue Hospital, New York, N. Y., Surgeon (R), U. S. Public Health Service

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Joseph G. Fallon, M.P.H., Biology Dept., Pacific Union College, Angwin, Calif., Instructor and Health Officer

Oliver N. Fellowes, Ph.D., 90 N. Ridgeway, Glenolden, Pa., Research Virologist, Sharp and Dohme, Inc.

Capt. Robert T. Foster, Sn.C., Bruns General Hospital, Santa Fe, N. M., Medical Inspector

Lt. Robert A. Gilkey, Sn.C., Box 38, Lawson General Hospital, Atlanta, Ga., Asst. Medical Inspector

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George K. Mar, Ph.D., National Health Administration, Chunking, China, Department Head (Food & Drug)

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Major Arvey C. Sanders, Sn.C., Station Hospital, Edgewood Arsenal, Md., Chief of Laboratory Service

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School Health Section

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Dental Health Section

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Unaffiliated

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Elizabeth C. Robison, 308 State Theatre Bldg., Harrisburg, Pa., State Commander, Field Army, American Cancer Society

Capt. V. S. Viswanathan, M.B., M.P.H., Stanley Medical College, Madras, India, Professor of Hygiene and Preventive Medicine and Vice Principal

Margaret B. Watson, Box 118, Walton, N. Y., Exec. Secy., Delaware County Tuberculosis Assn.

DECEASED MEMBERS AND FELLOWS

Cloyd M. Chapman, Glen Cove, N. Y., Elected Member 1941, Unaffiliated

W. D. Dotterer, Chicago, Ill., Elected Member 1916, Elected Fellow 1942, Laboratory Section

William F. Wild, M.D., Jackson Heights, L. I., N. Y., Elected Member 1927, Elected Fellow 1931, Health Officers Section

Mrs. C. Mayfield, M.S., New Orleans, La., Elected Member 1925, Elected Fellow 1941, Laboratory Section

Mary McCormick, R.N., Albany, N. Y., Elected Member 1937, Public Health Nursing Section

JOURNALS WANTED

The A.P.H.A. headquarters has exhausted its supply of June and August issues of the JOURNAL. Members who can spare any of these issues are requested to send them (collect) to the A.P.H.A. at 1790 Broadway, New York 19, N. Y.

EMPLOYMENT SERVICE

The Association Employment Service seeks to bring to the attention of appointing officers the names of qualified public health personnel and to act as a clearinghouse on employment. This is a service of the Association conducted without expense to the employer or employee.

From the registry of persons available, selected announcements are published from time to time. Appointing officers may obtain lists of all registrants on request.

Address all correspondence to the Employment Service, American Public Health Association, 1790 Broadway, New York 19, N. Y.

POSITIONS AVAILABLE

(Supplemental to list in November JOURNAL, page 1207)

Wanted: Public health statistician. College degree required and training or experience or both in epidemiology, vital statistics or administrative public health statistics. Several positions are available in New York City. Opportunity for formal training at a school of public health may be given to properly qualified applicants. Salary $2,700 minimum. Residence requirements waived. Persons interested can communicate with the Director, Bureau of Records and Statistics, New York City Health Department, 125 Worth St., New York 13, N. Y.

Active public health association in Eastern Metropolitan area seeks person experienced in community health education with reference to tuberculosis, child health, venereal disease, education, and nutrition. Salary up to $2,500 per annum. Write **Box T**, Employment Service, A.P.H.A.

STATE OF ARIZONA MERIT SYSTEM COUNCIL ANNOUNCES CONTINUOUS RECRUITMENT FOR FOLLOWING POSITIONS IN STATE DEPARTMENT OF HEALTH AND COUNTY HEALTH DEPARTMENTS:

Positions	*Salary Range*	
	Entrance	*Maximum*
Director of Local Health Unit	$350	$400
Health Officer-in-Training	300	350
Clinician in Field of Maternal and Child Health	350	400
Public Health Nursing Consultant	185	210
Public Health Nurse	160	185
Public Health Nurse, War Emergency	135	160
Junior Public Health Nurse	135	160
Public Health Nurse-in-Training	110	135
Staff Nurse	125	150
Staff Nurse, War Emergency	125	150
Sanitarian	160	210
Sanitarian-in-Training	160	185
Senior Bacteriologist-Serologist	175	225
Junior Bacteriologist-Serologist	125	175
X-Ray Technician	175	200
Vital Statistician	175	200

Apply J. Forrest Ingle, Merit System Supervisor, 411 Home Builders Bldg., Phoenix, Arizona.

POSITIONS WANTED

(Supplemental to list in November JOURNAL, page 1209)

Well qualified public health engineer will consider, 1: planning work requiring broad experience and educational background, 2: service with state or local governmental unit, 3: plant superintendent or plant engineer for sewage, water or combined utilities. **E-483**

Physician with background in vital statistics, epidemiology and preventive medicine seeks position in research or health administration. Salary from $3,600. **A-514**

Exhibit designer, now actively engaged in planning health education exhibits, seeks appointment with responsible organization where ability and experience can be recognized. Competent in supervision. Knows advertising and production. Sound postwar future desired. **H-511**

NEWS FROM THE FIELD

REORGANIZATION OF PUBLIC HEALTH STRUCTURE IN CANADA

It has been announced recently that the Dominion of Canada hereafter will have three new departments of government replacing the former Department of Pensions and National Health. These will be: (1) Department of Veterans Affairs, (2) Department of National Health and Welfare, (3) Department of Reconstruction.

The Department of National Health and Welfare will be headed by Mr. Brooke-Claxton, a Montreal lawyer who has been serving as assistant to Mr. Mackenzie King, the Prime Minister. The Deputy Minister of Welfare will be George F. Davidson, Ph.D. The Deputy Minister of Health will be Dr. Brock Chisholm, who has served as Director General of Medical Services for the Canadian Army and is a well known psychiatrist.

It is understood that, effective July 1, 1945, the plan has been adopted for grants-in-aid to each child in the Dominion irrespective of financial need. These are to be at the rate of $5 for children under 6 and $6 per month for children 6 to 10.

Dr. R. E. Wodehouse, who has served for many years as Deputy Minister of the Department of Pensions and National Health, has been appointed a Commissioner on the Canadian Pensions Board and a consultant in health to the Department of Veterans Affairs.

MASSACHUSETTS CELEBRATES SEVENTY-FIVE YEARS

The seventy-fifth anniversary of the establishment of the Massachusetts State Board of Health, the first in America, is to be celebrated in Boston by an all-day meeting on December 6. The honors are shared by the Antitoxin and Vaccine Laboratory which was opened fifty years ago.

Among the invited guests were Dr. Thomas Parran, Surgeon General of the U. S. Public Health Service, Brigadier-General James S. Simmons, of the office of the Surgeon General of the United States Army, Dr. C.-E. A. Winslow, of Yale University, Dr. Martha Eliot, of the U. S. Children's Bureau, Dr. Allan J. McLaughlin, formerly Commissioner of Health, Dr. Milton J. Rosenau, of the University of North Carolina, President-elect of the American Public Health Association, Dr. Paul B. Dunbar, Commissioner of the U. S. Bureau of Food and Drugs, and Dr. Reginald M. Atwater, of the American Public Health Association.

The program included a morning meeting at the Peter Bent Brigham Hospital, a buffet luncheon at the Antitoxin Laboratory, afternoon and evening meetings at Ford Hall, and dinner at the Parker House. Dinner guests included Governor Saltonstall, the Health Commissioners of the New England States, Deans of the Massachusetts schools of medicine and public health, and representatives of the American Public Health Association, the Massachusetts Medical Society, and the Massachusetts Public Health Association.

HEALTH EDUCATION FELLOWSHIPS AWARDED

The U. S. Public Health Service has announced that 28 fellowships in health education have been awarded to men and women in 20 states under a new program of the National Foundation for Infantile Paralysis and a continuing grant of the W. K. Kellogg Foundation. The National Foundation maintains 22 of the fellowships. Persons selected

will be assigned to courses in public health at Yale, University of Michigan, and the University of North Carolina. The training will consist of 9 months' academic work and 3 months' supervised field experience. Dr. Parran, in announcing the awards, said that the existing shortage of trained health educators and the demand for expansion of health education activities indicated, both in this country and abroad, the need for qualified personnel with a thorough understanding of both public health and education.

The recipients of the fellowships were announced as follows:

Linnea Anderson, Massachusetts
Ruth Brossman, Pennsylvania
Camille Brown, Wyoming
Theron Butterworth, Louisiana
Bessie Creecy, North Carolina
Nell Jane Guthrie, Oklahoma
Dorothy B. Hamilton, Washington, D. C.
Dorothy Ann Huskey, Tennessee
Margaret Idema, Texas
Marion Jensen, Tennessee
Maizie Jean Jones, North Carolina
Rae E. Kaufer, Maryland
Mary Lou King, Florida
Mary Evelyn Leith, South Carolina
Raymond Leonard, North Carolina
Edith R. Lindly, Oklahoma
Wilma Mailander, Nebraska
Jean McCartney, Indiana
Leila McCormick, North Carolina
Frances Montgomery, Arizona
Hazel Mundorff, Nebraska
Gladys C. Omohundro, Virginia
Julia O'Neill, Illinois
Maude Parker, Virginia
Mary H. Parks, Kansas
Jeanette Simmons, Iowa
Louisa Spell, Georgia
Helen Wilson, North Dakota

CLAXTON APPOINTED CANADIAN MINISTER OF NATIONAL HEALTH AND WELFARE

Prime Minister W. L. Mackenzie King, of the Dominion of Canada, recently announced in Ottawa the appointment of Brooke Claxton as Minister of National Health and Welfare. Mr. Claxton has been parliamentary assistant to the Prime Minister and enters the Cabinet for the first time. Among other responsibilities he will set up the machinery for the administration of family allowances.

WESTERN RESERVE OFFERS GRADUATE WORK IN HEALTH EDUCATION

Professor James A. Doull of the Department of Hygiene and Bacteriology, Division of Public Health, Western Reserve University Graduate School, Cleveland, Ohio, has announced that students interested in health education as a career and who have had college courses in chemistry, physics, and biology, may be accepted for graduate work after consultation with Dr. Doull, chairman of the department. Basic courses are given in this and other departments in the School of Medicine and in other schools of the university. The laboratories are well equipped and there is an exceptionally good library in the department, supplementing the Cleveland Medical Library, which is on the campus. Practical instruction is under the supervision of Dr. Bruno Gebhard, Associate in Health Education and Director of the Cleveland Museum of Health. Two academic years are required for the Master's degree except for persons with unusual preparation.

NEW YORK STATE ADOPTS CHEESE REGULATIONS

Effective November 15, 1944, the New York State Sanitary Code has been amended to prevent the sale of uncured cheddar type cheese made from raw milk. According to *New York State Health News*, the need for this protection is indicated by the occurrence this year of four outbreaks of typhoid fever in the United States and Canada traced to cheese as compared with ten such outbreaks reported during the preceding 20 years. It appears that the unusual demand for cheese and the overcrowding of cold storage ware-

houses, together with the fact that uncured cheese may be sold at the same ceiling price as cured cheese and that the public likes the mild, unripened cheese, has resulted in cheese made from raw milk reaching consumers before sufficient time has elapsed to permit typhoid organisms, if present, to be devitalized.

Unless the cheese itself is subjected to heat treatment equivalent to pasteurization and processing, it is required either to be made from milk, skim milk, or cream which has been pasteurized, or the cheese is required to be ripened or cured at a temperature of not less than 35° F. for a period of not less than 60 days from the date of manufacture. The regulations require the suitable labeling of all cheese sold in New York State.

BAILEY B. BURRITT RETIRES

Mr. Bailey Burritt of New York, N. Y., retired November 1 as Chairman of the Executive Council of the New York Community Service Society. President Roosevelt and other leaders joined with representatives of the nation's health and welfare agencies in praising the career of Mr. Burritt at a testimonial dinner. Mr. Burritt was organizer and director of the Home Service Division of the American Red Cross for the A.E.F. in France during the first World War. He has served with the Community Service Society and its predecessor agency for thirty-one years.

DDT CONSIDERED SAFE FOR INSECTICIDAL USE

Dr. Paul A. Neal, Chief of the Research Section of the Division of Industrial Hygiene, U. S. Public Health Service, reported on November 2 that, in spite of its inherent toxicity, DDT in the desired insecticidal concentrations in air is of such low toxicity that it will not cause injurious effects in human beings. According to Dr. Neal, the studies conducted at the Industrial Hygiene Research Laboratory of the National Institute of Health showed that DDT in concentrations up to 10 per cent in inert powders for dusting clothes, as in the extermination of lice, offers no serious health consequences. He believed it safe to use as a fly spray. A clinical and laboratory study of three men who had several months of continuous occupational exposure to DDT in its various forms as an insecticide failed to indicate any definite toxic effects from exposure to the drug. In experiments with dogs, daily insufflation of 100 milligrams of DDT per kilogram caused definite signs of poisoning in only one out of the three animals tested after a period of 18 days. Dr. Neal pointed out, however, that massive doses, either by mouth or by skin absorption will cause toxic reactions. Heavy contamination of foods should be avoided. He concluded that, despite the inherent toxicity, the use of DDT in 1 to 5 per cent solutions in 10 per cent cyclohexanone with 85 to 95 per cent Freon should offer no serious health hazards when used as an insecticide.

Major General Norman T. Kirk, Surgeon General of the U. S. Army, reported to the Association of Military Surgeons of the United States at its meeting in New York City on November 3, that DDT had been effective in the control of malaria when sprayed from airplanes at tree-top height. According to Dr. Kirk, DDT will kill adult mosquitoes and flies as well as those in the larval stages when it is used in breeding areas. He reported that Saipan had been a mass of flies and mosquitoes on D Day but that the island was now free of both. He reported that the aerosol bomb kills all insect vectors in closed spaces, particularly the mosquito and fly, and is used extensively to rid airplanes of those

vectors. A 5 per cent solution of DDT sprayed on the walls of barracks, kitchen, or huts will kill all mosquitoes and flies alighting thereon for months after each spraying. He credited DDT with preventing the threatened epidemic in Naples.

NEW PUBLIC HEALTH APPOINTMENTS IN CUBA

It has been announced that Dr. Jose Antonio Presno has been appointed as the new Secretary of Health for Cuba.

Dr. Pedro Nogueira has been appointed Director of Health. Dr. Nogueira was formerly associated with the Rockefeller Foundation.

The Sub-Secretary of Health is Dr. Fernando Lopez.

Dr. Domingo F. Ramos continues as Director of the Finlay Institute in Havana.

NOBEL PRIZES AWARDED FOUR DOCTORS

Announcement was made in Stockholm, Sweden, on October 26, of the award of Nobel prizes in medicine to four scientists, all of them now in the United States, as follows:

The 1944 award in physiology and medicine was made to Dr. Joseph Erlanger, Professor of Physiology at Washington University School of Medicine, St. Louis, Mo., and to Dr. Herbert S. Gasser of New York, N. Y., Director of the Rockefeller Institute for Medical Research. This award covers studies of the functions of individual nerve threads.

The 1943 award was also divided equally between Dr. Edward A. Doisy, Professor of Biochemistry in the St. Louis University School of Medicine and Dr. Henrik Dam of Copenhagen, Denmark, who is now at the Strong Memorial Hospital, Rochester, N. Y. The reward covers studies of these scientists with relation to vitamin K which is concerned in the coagulation of blood.

CONFERENCE OF PROFESSORS OF PREVENTIVE MEDICINE

At the second annual meeting of the Conference of Professors of Preventive Medicine held in New York City on October 2, the following officers were elected:

President, William Harvey Perkins, M.D., Dean, Jefferson College
Secretary, Thomas D. Dublin, M.D., Long Island School of Medicine

Dr. Dublin will welcome suggestions for the 1945 program from qualified workers in the field.

DR. FELIX HEADS MENTAL HYGIENE DIVISION, U.S.P.H.S.

Dr. Thomas Parran on November 1 announced the appointment of Dr. Robert H. Felix as Medical Director in charge of the Mental Hygiene Division in the Bureau of Medical Services, U. S. Public Health Service, Bethesda, Md. Dr. Felix relieves Dr. Lawrence Kolb who retired October 31. Dr. Felix is a native of Kansas, born in 1904, is a graduate in medicine of the University of Colorado in 1930, and was commissioned in the regular corps of the Public Health Service in 1933. He received an M.P.H. from Johns Hopkins in 1942.

DR. SPENCER AWARDED MEDAL FOR CANCER SERVICE

Roscoe R. Spencer, M.D., Chief of the National Cancer Institute, Bethesda, Md., has been awarded the Clement Cleveland Award for outstanding service during 1944 in the effort to control cancer by education. The Palladium medal named in honor of one of the founders of the American Cancer Society, was presented at the annual meeting of the New York City Cancer Committee which was opening a drive for $100,000 in an annual budget directed toward preventing the death of 40 persons a day from cancer in New York City.

PERSONALS

Central States

STEPHEN C. BRADLEY, M.D., has been placed in charge of the Department of Contagious Diseases of the Terre Haute (Ind.) Board of Health, succeeding the late MAURICE B. VAN CLEAVE, M.D.

ARTHUR V. DE NEVEU, M.D., recently resigned as Medical Director of the Johnston Emergency Hospital, Milwaukee, Wis., to enter private practice; he held the position for 18 years.

ORLEN J. JOHNSON, M.D.,† since August, 1941, Assistant Secretary, Council on Industrial Health of the American Medical Association, Chicago, Ill., has resigned to enter a residency in surgery at St. Luke's Hospital.

ROLL H. MARKWITH, M.D.,* Columbus, Ohio, retired as Director of the Ohio Department of Health on August 21, when his five year term expired, to become Assistant Medical Director of the Clinical Laboratory owned and operated by ANSON L. BROWN, M.D., of Columbus.

LOUIS K. PECK, M.D., has been appointed Health Officer of Crawford, Kalkaska, Missaukee, and Roscommon Counties, with headquarters in Lake City, Mich.

CLARKE ROGERS, M.D., Indianapolis, Ind., has been appointed a member of the Indianapolis Board of Health to succeed ARTHUR F. WEYERBACHER, M.D., resigned.

Eastern States

EARL C. BONNETT, M.D., of New York, N. Y., formerly Associate Medical Director of the Metropolitan Life Insurance Company, has been appointed Medical Director of the Company by the Board of Directors. Dr. Bonnett succeeds the late CHARLES L. CHRISTIERNIN, M.D., who died on October 18.

LOUIS I. DUBLIN, PH.D.,* New York, second Vice President and Statistician of the Metropolitan Life Insurance Company, on October 2 became temporary Executive Officer of the American Red Cross and will serve in this capacity until the return of BASIL O'CONNOR, who is now on an inspection tour of Red Cross operations in France and Great Britain. Dr. Dublin is on loan to the Red Cross for a limited period. His normal assignment is as assistant to Mr. O'Connor, acting as coördinator of the various operating divisions of the Red Cross. In his new appointment Dr. Dublin will devote full time to Red Cross activities.

OSCAR A. DUDLEY, M.D., of Shrewsbury, Mass., Massachusetts Public Health Officer for the Worcester district for 25 years, who was decorated with the Croix de Guerre by the French Government for heroism in the first World War, died on October 28, 1944.

ELIZABETH M. GARDNER, M.D.,* Albany, N. Y., Director of the Division of Maternity, Infancy and Child Hygiene, State Health Department, retired from state service.

EDWARD B. KRUMBHAAR, M.D., Professor of Pathology in the University of Pennsylvania School of Medicine and Graduate School, has been elected an honorary fellow of the Royal Society of Medicine, London, "in recognition of his distinguished services to science."

WILLIAM E. STANLEY,* formerly Professor of Sanitary Engineering at Cornell University, and well known as a consulting sanitary engineer, has been appointed professor in charge of sanitary engineering courses in the department of civil and sanitary engineering at the Massachusetts Insti-

* Fellow A.P.H.A.
† Member A.P.H.A.

tute of Technology, Cambridge, Mass. Professor Stanley recently returned from North Africa where he served as a major in the Corps of Engineers and had assignments as Water Supply Officer for 7 months during the North African Invasion and the Tunisian Campaign and Chief of Construction in the Service of Supply for 8 months.

Southern States

PEYTON M. CHICHESTER, M.D., Assistant Director of Local Health Services with headquarters in Richmond, Va., of the State Health Department, has been named to a similar position at Abingdon to succeed HAROLD M. KELSO, M.D.,† who has accepted a position with the Knoxville, Tenn., Health Department.

LYNN M. GARNER, M.D.,† formerly Health Officer of District Number 8 with headquarters at Higginsville, Mo., has been appointed Director of the Division of Child Hygiene for the State Board of Health, Jefferson City, Mo.

BRIGADIER GENERAL LEON A. FOX,* U.S.A., has been awarded the Typhus Commission Medal for "exceptionally meritorious service rendered first as Director and later as Field Director the United States of America Typhus Commission." General Fox directed the Typhus Control Project of Naples in December, 1943, which brought the epidemic in southern Italy under control within a month.

ROBERT H. FOSDICK, JR., M.D., New Albany, Miss., has resigned as Health Officer of Marshall and Union Counties; he will enter private practice in New Albany.

ROBERT B. GRIFFIN, M.D.,† has been named Director of the Jackson and Madison County Health Department, Tenn., to succeed LAMAR A. BYERS, M.D., who accepted a similar position in Coos County, Ore.

CHARLES J. GRUBIN, M.D.,† Arlington, Va., has been named Health Officer of Madison County, Ky., with offices in Richmond.

BARBARA HUNT, M.D.,† Meridian, Miss., has been appointed Health Officer of Chickasaw County.

RUTHERFORD O. INGHAM, M.D.,* Johnson City, Tenn., has resigned as Director of the Washington County Health Department. He will be succeeded by MARION G. FISHER, M.D.,† Jonesboro, Tenn.

JOHN P. KENNEDY, M.D.,* recently retired as Health Officer of Atlanta, Ga., a position he held for 43 years.

G. P. MORISON, M.D., has been appointed part-time Health Officer of Berkeley County, W. Va., succeeding H. R. DUPUY, M.D.†

JOSEPH T. NARDO, M.D.,† Somerville, Tenn., has resigned as Director of the Fayette County Department of Health to reënter the U. S. Public Health Service.

WARD L. OLIVER, M.D., of Pointe Pleasant, W. Va., Health Officer for District Number 3, has been transferred to Morgantown as Health Officer of Monongalia County. He succeeds WILLIAM B. BAILEY, M.D.,† who was transferred to Norfolk, Va.

MARIE-LOUISE M. PARETI, M.D.,† has resigned as Acting Chief of the Section of Maternal and Child Health of the Louisiana State Board of Health to become assistant to JAMES R. REINBERGER, M.D., Memphis, Tenn.

FRAY O. PEARSON, M.D.,† Director of the Chattanooga-Hamilton County Health Department, Tenn., has resigned to enter private practice and become associated with the Earl Campbell Clinic, effective October 1.

ROBERT E. ROTHERMEL, M.D.,† has been appointed Director of the Har-

* Fellow A.P.H.A.
† Member A.P.H.A.

rison County Health Department, Miss., succeeding HENRY W. KASSEL, M.D.,† who has been assigned to a position in Guatemala City, Guatemala.

WILLIAM P. SCARLETT, M.D., Director of the Division of Venereal Diseases in the Corpus Christi Health Department, has been appointed in charge of the Wichita County Health Unit, Texas, succeeding DAVID F. BRADLEY, M.D., who has been appointed Medical Officer in charge of the State Quarantine Hospital, Corpus Christi.

ELVIRA A. CORRALES-SMITH, M.D., Monroe, La., has been appointed Director of the Arcadia Parish Health Unit.

LLOYD L. TATE, M.D., of St. Louis, Mo., has been named Health and Hygiene Director of the St. Louis public schools.

GEORGE WALDEN, M.D., has been appointed Health Officer of Lincoln County, W. Va., succeeding G. L. MCCLELAN, M.D.,

FREDERICK J. WAMPLER, M.D.,* has resigned as Professor of Preventive and Industrial Medicine at the Medical College of Virginia, Richmond, to become Medical Director of the Rustless Iron and Steel Corp., Baltimore, Md.

DON E. WILDER, M.D., Grayson, Ky., has been named Health Officer of Breathitt County.

WALLACE BYRD, M.D.,† Williamstown, Ky., has resigned as Health Officer of Grant County.

WILLIAM L. WRIGHT, M.D., Louisville, Ky., has been placed in charge of the Bell County Health Department, Pineville.

Western States

JACOB C. GEIGER, M.D.,* of San Francisco, Calif., on October 14 received the honorary degree of Doctor of Science from Tulane University of Louisiana School of Medicine, New Orleans. Dr. Geiger gave the commencement address on this occasion.

DAVID E. SMALLHORST, M.D.,* Glendale, Calif., Health Officer for the San Fernando District, has retired under civil service rules. He has been connected with the Los Angeles County Health Department since 1926.

DEATH

DR. RICHARD V. HENDERSON of the National Institute of Health, Bethesda, Md., died October 20 at the age of 32 while engaged in developing a vaccine against scrub typhus. His death apparently resulted from a laboratory infection.

* Fellow A.P.H.A.
† Member A.P.H.A.

CONFERENCES AND DATES

American Medical Association—91st Annual Session. Philadelphia, Pa. June 18–22, 1945.

American Society of Heating and Ventilating Engineers—51st Annual Meeting. Hotel Statler, Boston, Mass. January 22–24, 1945.

American Water Works Association—
New York Section—Mid-winter Luncheon Meeting, Pennsylvania Hotel, New York, N. Y. January 17, 1945.

Annual Seminar on Reading Disabilities. Pennsylvania State College, State College, Pa. January 29–February 2, 1945.

Florida Public Health Association. Gainesville, Fla. December 4–6.

National Council of Chief State School Officers—Illinois Education Association. Springfield, Ill. December 27–29.

National Council of State and Local Public Assistance and Welfare Administrators. Chicago, Ill. December 12–13.

National Restaurant Week—May 6–12, 1945.

National Society for the Prevention of Blindness—Annual Meeting. Russell Sage Foundation, New York, N. Y. December 14.

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